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RF/RMRS 98-250 UN



1997 GROUNDWATER MONITORING
AT THE
PRESENT SANITARY LANDFILL
ROCKY FLATS ENVIRONMENTAL
TECHNOLOGY SITE

Final



August 10, 1998

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ACRONYMS AND ABBREVIATIONS

ALF	Action Level Framework
ANOVA	analysis of variance
CDPHE	Colorado Department of Public Health and Environment
cm/sec	centimeters/second
DOE	U S Department of Energy
EPA	U S Environmental Protection Agency
ft	feet
GMAP	Groundwater Monitoring Assessment Plan
GWAP	Groundwater Assessment Plan
IAG	Interagency Agreement
IHSS	individual hazardous substance sites
IM/IRA	Interim Measure/Interim Remedial Action
L	liter
LEL	lower explosive limit
LHSU	lower hydrostratigraphic unit
mg	milligram
μg	microgram
OU7	Operable Unit 7
pCi	picoCurie
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
TDS	total dissolved solids
TSS	total suspended solids
UHSU	upper hydrostratigraphic unit
VOC	volatile organic compound

1.0 INTRODUCTION

This report presents 1997 data for groundwater quality at the Present Sanitary Landfill, Rocky Flats Environmental Technology Site (RFETS). The Present Landfill serves as the solid waste disposal facility for RFETS and is one of three interim status units at RFETS that are regulated under the Resource Conservation and Recovery Act (RCRA). Throughout 1997, groundwater monitoring was conducted in accordance with regulations of the Colorado Department of Public Health and Environment Health (CDPHE), contained in Title 6 of the Colorado Code of Regulations, 6 CCR 1007-2, and 6 CCR 1007-3. These codes pertain to solid-waste disposal sites and facilities, and require a determination of the impact of the Present Landfill on water quality in the uppermost aquifer.

Information compiled for the 1997 Landfill Report includes a review of historical activities at the Present Landfill (Section 2.0), a summary of previous investigations (Section 3.0), the status of the current monitoring program (Section 4.0), the current understanding of the physical characteristics of groundwater flow at the site (Section 5.0), an assessment of groundwater quality (Section 6.0), a summary of plume investigation activities for the Property Utilization & Storage yard (Section 7.0), well abandonment and replacement activities (Section 8.0), and general conclusions regarding groundwater quality and the groundwater monitoring program at the Present Landfill at RFETS (Section 9.0).

2.0 OPERATING HISTORY OF THE PRESENT LANDFILL

The Present Landfill began operating August 14, 1968, for the disposal of Rocky Flats sanitary waste. However, records indicated that, prior to 1986, some hazardous waste was disposed of at the landfill, therefore, in 1986, the landfill became classified as a RCRA-regulated unit. Disposal of hazardous constituents in the landfill was halted in November of 1986. The landfill has remained in operation and currently is accepting only nonhazardous solid waste. The following paragraphs provide a brief historical summary of the landfill.

In September 1973, tritium was detected in leachate draining from the landfill. In response to this detection, a sampling program was initiated to determine the location of the tritium source. In addition, radiation monitoring of waste prior to burial was initiated to prevent further disposal of radioactive material, and interim-response measures were undertaken to control the generation and migration of landfill leachate. Interim-response measures included the construction of two ponds (Ponds No. 1 and No. 2, also known as the West Landfill Pond and East Landfill Pond, respectively) immediately east of the landfill, and the installation of a subsurface leachate-collection system and subsurface intercept system for diverting groundwater around the landfill. Ditches were also constructed to control surface water.

The West Landfill Pond embankment was built approximately 500 ft east of the 1974 position of the advancing face of the landfill. The East Landfill Pond embankment was constructed approximately 1,000 ft east of the West Landfill Pond embankment. A cutoff wall, set in bedrock, was constructed in the East Landfill Pond embankment to reduce seepage through the embankment foundation. The embankments and ponds were built to collect and evaporate groundwater, surface water, and leachate collected by the subsurface drainage-control system.

The leachate-collection system and groundwater-intercept/diversion system were constructed around the west, north, and south perimeters of the landfill. The leachate-collection system was designed to provide a perimeter drain for landfill leachate to prevent migration of leachate and to reduce water levels in the landfill. The groundwater-intercept/diversion system was constructed along the outside edge of the collection system to prevent groundwater from entering the landfill area. Groundwater is diverted from the landfill toward the East Landfill Pond.

Between 1977 and 1981, the leachate-collection trench was buried beneath waste during landfill expansion (DOE, 1996a). The west embankment and West Landfill Pond were removed in 1981, and two slurry walls were constructed, extending from the ends of the north and south groundwater-interceptor ditches. These slurry walls range in depth from 10 ft to 25 ft, and were seated in bedrock.

Sometime after the Present Landfill went into operation in 1968, excess water from the landfill pond was sprayed onto a ridge south of the East Landfill Pond. The sprayed water collected on the roadway and flowed into North Walnut Creek. When this misdirected flow was discovered, the spraying activities were moved to an area north of the landfill pond adjacent to an irrigation ditch. Because the subsequent spray water then collected in local drainage channels and flowed around the landfill pond to the main drainage, the spraying activities were again moved. The final spray location was an area south of the west end of the landfill pond, excess spray water flowed back into the East Landfill Pond.

In 1995 a gravity flow treatment system was constructed to collect contaminated groundwater and leachate flowing from the eastern end of the Present Landfill. The Passive Seep Interception and Treatment System (PSITS) became operational in early 1996 and treats landfill leachate to eliminate FO39-listed wastes prior to discharge into the East Landfill Pond.

The treatment system is composed of a settling basin, bag filters to remove suspended solids and granular activated carbon to remove organic chemical constituents. Besides periodic change-out of the activated carbon and filter bags the system operates in a passive configuration. The effluent is sampled periodically and the results are published in the Quarterly Report for the Consolidated Water Treatment Facility and OU7 Passive Seep Interception System.

Groundwater discharging from the landfill mixes with Landfill Pond water where it either evaporates or is pumped to Pond A-3 via the Pond A-1 bypass for eventual discharge from the Site. Subsurface leakage of the pond may also occur, which functions to recharge the unconsolidated deposits below the landfill pond dam and underlying bedrock claystones. The amount of leakage is expected to be small based on the low hydraulic conductivity of the underlying bedrock materials.

Groundwater monitoring was instituted in 1989 in accordance with 6 CCR 1007-2 and 6 CCR 1007-3, Subsection 265 90(d). This report addresses monitoring requirements pertaining to solid-waste disposal sites and facilities (6 CCR 1007-2). Monitoring pertaining to hazardous-waste

sites (6 CCR 1007-3) are addressed in the Annual RCRA Groundwater Monitoring Reports (U S Department of Energy [DOE], 1990, 1991, 1992a, 1993, 1994, 1995, and 1996) The regulations require that the groundwater monitoring program be capable of determining the impact of a facility on the water quality in the uppermost aquifer

The Annual RCRA Reports for RFETS describe chemical and physical aspects of groundwater (for 1989 through 1995) at the Present Landfill (DOE, 1990, 1991, 1992a, 1993, 1994, 1995, and 1996) The *Phase I RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan for Operable Unit 7 Present Sanitary Landfill* (DOE, 1991) presents additional information regarding construction, operation, regulatory history, and site characterization Work conducted for Phase I included cone penetrometer testing, soil sampling, and the installation and sampling of additional groundwater monitoring wells

A closure plan for the Present Landfill was developed in the IM/IRA decision document (DOE, 1996a), in accordance with the Rocky Flats Cleanup Agreement (RFCA) (RFCA, 1996) and applicable Colorado hazardous-waste regulations Due to the Present Landfill's position (25) on the Environmental Restoration Ranking (DOE, 1996a) action has been deferred until higher ranked areas are remediated Post-closure inspection, maintenance, and monitoring of the Present Landfill will be performed in accordance with 6 CCR 1007-3, Part 265, Subpart G

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

Annual RCRA Groundwater Monitoring Reports from 1989 through 1996 describe groundwater elevations and flow rates, as well as the results of the groundwater analyses The sampling and analysis records were maintained in compliance with 6 CCR 1007-3 and 40 CFR 265 94(b) The *Phase I RFI/RI Work Plan for OU7 - Present Sanitary Landfill* (DOE, 1991a) and the Operable Unit 7 Revised Draft Interim Measure/Interim Remedial Action (IM/IRA) Decision Document and Closure Plan (DOE, 1996a) present additional information

The nature and extent of groundwater contamination at the Present Landfill have been evaluated in previous Annual RCRA Groundwater Monitoring Reports (DOE, 1990, 1991, 1992a, 1993, 1994, 1995, 1996a, 1996b) In 1992, groundwater from surficial deposits within and around the Present Landfill had concentrations of major anions (bicarbonate, chloride, nitrate/nitrite, sulfate), total dissolved solids [TDS], dissolved metals (calcium, chromium, lithium, magnesium, potassium, sodium, and strontium), and radionuclides that were elevated relative to mean background concentrations/activities Some volatile organic compounds (VOCs) were also detected The dissolved radionuclides present included americium-241, plutonium-239+240, uranium-233+234, uranium-238, and radium-226 Throughout 1992, concentrations of dissolved metals and radionuclides were only rarely greater than mean background concentrations

During 1992, VOCs were detected sporadically and infrequently in wells screened in surficial materials of the upper hydrostratigraphic unit (UHSU) In UHSU bedrock, VOCs were detected in groundwater sampled from two wells Methylene chloride, acetone, and toluene were detected once The infrequent occurrence of VOCs in the UHSU bedrock indicated that the Present Landfill had not adversely impacted groundwater in UHSU bedrock, even though some contamination of groundwater had occurred in UHSU surficial materials overlying the bedrock

In 1993, the groundwater chemistry at the Present Landfill appeared generally consistent with water-quality conditions of 1992 (DOE, 1994) The 1993 statistical comparisons of upgradient versus downgradient UHSU groundwater at the Present Landfill indicated statistically significant increases in downgradient concentrations of dissolved metals (calcium, lithium, magnesium, potassium, sodium, and strontium), and major anions (chloride and sulfate) None of the radionuclides or VOCs showed a statistically significant difference in upgradient versus downgradient activities or concentrations, respectively Radionuclide activities and concentrations of VOCs, metals, and anions were notably highest within the landfill and in the area adjacent to Individual Hazardous Substance Sites (IHSSs) located southeast of the landfill, relative to other areas in the vicinity of the Present Landfill In groundwater from UHSU bedrock beneath and downgradient of the landfill, VOCs were detected infrequently, but radionuclides were present at activities higher than mean background

Analysis of 1994 data by analysis of variance (ANOVA) indicated statistically significant differences in upgradient versus downgradient groundwater quality in the total UHSU for radionuclides (uranium-233 + 234 and uranium-238), dissolved metals (calcium, lithium, magnesium, sodium, and strontium), anions (carbonate, chloride, fluoride, and sulfate), and TDS (DOE, 1995). In the UHSU bedrock, there were statistically significant differences in upgradient versus downgradient groundwater quality for dissolved metals (calcium, lithium, magnesium, sodium, and strontium), anions (bicarbonate, chloride, and sulfate), and TDS. All VOCs had less than 50-percent quantifiable results.

For 1995, statistical comparisons of upgradient versus downgradient UHSU groundwater at the Present Landfill indicated statistically significant increases in levels of dissolved barium, calcium, lithium, magnesium, silicon, sodium, strontium, uranium-233 + 234, and gross beta, as well as bicarbonate, chloride, sulfate, and TDS. Activities of total americium-241, plutonium-239 + 240, and tritium did not show statistically significant difference between upgradient and downgradient UHSU groundwater. All VOCs were detected in fewer than 50 percent of the samples, so these analytes were not statistically evaluated.

Conditions at the Present Landfill in 1995 appeared generally consistent with those of 1994, in 1994 there were 15 inorganic parameters with significant differences in concentrations up and downgradient of the Present Landfill. In 1995, 16 inorganic parameters displayed significant differences. Contaminants detected in monitoring wells southeast of the Present Landfill may be due to an inadequately functioning groundwater-intercept system in this area, emplacement of wastes beyond the limit of the intercept system, or impacts associated with other IHSSs adjacent to the landfill. Organic contaminants appear to be migrating from an upgradient source, perhaps IHSS 174, with a plume that is traversing along and through the southern portion of the Present Landfill.

Analysis of 1996 data confirms results of previous sampling. Approved well abandonments and deactivations prevented statistical analysis for many analytes. Detected analytes and

concentration ranges were generally consistent with those detected in prior years Barium, calcium, chromium, lithium, magnesium, potassium, selenium, and sodium were detected in downgradient wells at levels below mean background concentrations Nitrate and tritium were evaluated using ANOVA techniques and were determined to be statistically similar in upgradient versus downgradient samples As in prior investigations, there was no indication of volatile organic contamination in downgradient wells

Results of hydrogeologic investigations of the Present Landfill suggest that the groundwater-intercept system may not completely isolate the landfill from the surrounding groundwater Hydraulic assessments for specific areas on the west, north, and south sides of the groundwater-intercept system indicate that groundwater may flow into the landfill on the northwest side and possibly the southwest side where the leachate collection system was not completely keyed into bedrock (DOE, 1996a)

Previous reports indicate that the leachate collection trench was buried beneath waste during landfill expansion (DOE, 1996a) Therefore, the clay cutoff wall no longer extends to the surface of the landfill, this would allow groundwater to flow across the clay cutoff wall if the water table were to rise sufficiently Landfill wastes do not extend to the surface-water interceptor ditch

An evaluation of groundwater-elevation data for 1991 through 1995 and the hydrologic evaluation data for the OU7 IM/IRA indicate that previous conclusions made regarding the impact of the leachate/groundwater-intercept system are still valid These conclusions are

- The groundwater-intercept system diverts groundwater away from the west end of the landfill but may not divert all groundwater from the north and south sides of the landfill
- The clay barrier is an effective barrier to groundwater flow in the landfill along the west but it is not completely keyed into bedrock on the northwest and southwest sides This may allow groundwater to enter the landfill at times

4.0 CURRENT GROUNDWATER MONITORING PROGRAM

The Present Landfill at RFETS currently operates under CDPHE and Environmental Protection Agency (EPA) guidelines for solid waste disposal sites and facilities and accepts only nonhazardous waste. The groundwater-monitoring program was instituted in accordance with the Rocky Flats Cleanup Agreement (RFCA, 1996) and state regulation 6 CCR 1007-2 for compliance with RCRA. RCRA groundwater monitoring is conducted to detect potential excursions of contamination beyond an established point of compliance based on comparisons of upgradient to downgradient groundwater quality.

Recent changes to the site groundwater monitoring program are outlined in the Draft Integrated Monitoring Plan (IMP) (DOE, 1997). This plan specifies the monitoring and reporting requirements for the Present Landfill, including well identification, sampling frequency, analytical requirements, and reporting. Operating procedures are used to specify techniques for sample collection, preservation, shipment, and chain-of-custody control.

For the reporting period, upgradient wells 70193, 70393, 70493, and 5887 and downgradient wells 4087, 52894, and B206989 were sampled to determine compliance with RFCA, as set forth in the IMP. Wells 6687 and 76992 - located along the southern and southeastern perimeter of the landfill, respectively - were also sampled in 1997 for monitoring contaminant migration associated with the Present Landfill/PU&D yard VOC plume. Table 4-1 summarizes sampling activities and shows the hydrostratigraphic unit monitored and material screened for all wells sampled in and near the Present Landfill in 1997. The limited number and position of these wells makes it infeasible to construct potentiometric-surface maps and concentration-isopleth maps, thus current and future reports will only assess impacts to or from the landfill on the landfill boundaries.

Groundwater elevations for active wells were measured quarterly and samples were collected semi-annually as directed in the Integrated Monitoring Plan (DOE, 1997). Groundwater samples

Table 4-1
Well Completion Information and Sampling Summary for Present Landfill Wells

Well	Hydro-Stratigraphic Unit	Screened Material	Quarterly Sampling Summary			
			Q1	Q2	Q3	Q4
Upgradient Wells						
70193	UPPER	BEDROCK			M,R,V,W	
70393	UPPER	ALLUVIUM	M,R,V,W		M,R,V,W	
70493	UPPER	BEDROCK			M,R,V,W	
5887	UPPER	ALLUVIUM	M,R,V,W		M,R,V,W	
Downgradient Wells						
B206989	UPPER	BEDROCK	R,V,W		R,V,W	
52894	UPPER	ALLUVIUM		M,R,W		M,R,V,W
4087	UPPER	ALLUVIUM			R,V,W	
Other Landfill Wells						
76992	UPPER	ALLUVIUM		M,R,V,W		M,R,V,W
6687	UPPER	ALLUVIUM		M,R,V,W		

M = Metals

R = Radionuclides

V = Volatile organic compounds

W = Water quality parameters

were analyzed for radionuclides, volatile organic compounds (VOCs), dissolved metals, and major anions, in accordance with Appendix E-3 of the IMP. Some historical potential contaminants-of-concern (PCOC), such as semi-VOCs, were not included in the sampling program as a result of PCOC screening conducted during the IMP data quality objective process. Table 4-2 lists the constituents monitored for wells in and near the Present Landfill. Concentrations and spatial distributions of analytes detected above upgradient concentrations are depicted on in Figures 4-1 through 4-4. Four wells previously monitored for methane gas (6287, 6687, B106089, and 71693) have been abandoned as part of the Well Abandonment and Replacement Program (WARP). Well 6687 was replaced by new well 00597 which may be used for methane monitoring in the future. The records of analyses and evaluations are maintained in compliance with 6 CCR 1007-2.

5.0 PHYSICAL CHARACTERISTICS OF THE GROUNDWATER SYSTEM

5.1 Description of the "Uppermost Aquifer"

The "uppermost aquifer" is equivalent to the UHSU as described in recent RFETS reports (EG&G, 1995, 1995a, and 1995b). In the area of the Present Landfill, the UHSU is composed of unconsolidated surficial deposits and weathered bedrock. The unconsolidated deposits consist of Rocky Flats Alluvium, colluvium, and valley-fill alluvium. The Rocky Flats Alluvium and artificial fill (landfilled wastes and soil-cover materials) are present upgradient of and within the landfill, respectively, colluvium and valley-fill alluvium are present downgradient of the Present Landfill. Weathered claystones and weathered sandstones that are in direct hydraulic communication with the overlying surficial deposits, are also considered part of the uppermost "aquifer". The weathered claystones are generally more permeable than unweathered bedrock. Unweathered claystones are not considered as part of the uppermost aquifer, rather they are included as part of the LHSU. Bedrock wells were assigned to a hydrostratigraphic unit based on geochemical data from the well, hydraulic conductivity measurements (where available), and information from borehole logs.

Table 4-2
Chemical Constituents Monitored at the Present Sanitary Landfill

1,1,1,2-TETRACHLOROETHANE	N-PROPYLBENZENE	TRITIUM
1,1,1-TRICHLOROETHANE	NAPHTHALENE	U-233/234
1,1,2,2-TETRACHLOROETHANE	P-ISOPROPYLtolUENE	U-235
1,1,2-TRICHLOROETHANE	SEC-BUTYLBENZENE	U-238
1,1-DICHLOROETHANE	STYRENE	
1,1-DICHLOROETHENE	TERT-BUTYLBENZENE	
1,1-DICHLOROPROPENE	TETRACHLOROETHENE	NITRATE/NITRITE
1,2,3-TRICHLOROBENZENE	TOLUENE	FLUORIDE
1,2,3-TRICHLOROPROPANE	TRANS-1,2-DICHLOROETHENE	SULFATE
1,2,4-TRICHLOROBENZENE	TRANS-1,3-DICHLOROPROPENE	TOTAL DISSOLVED SOLIDS
1,2,4-TRIMETHYLBENZENE	TRICHLOROETHENE	
1,2-DIBROMO-3-CHLOROPROPANE	TRICHLOROFUOROMETHANE	
1,2-DIBROMOETHANE	VINYL CHLORIDE	
1,2-DICHLOROBENZENE	XYLENES, TOTAL	
1,2-DICHLOROBENZENE-D4		
1,2-DICHLOROETHANE	ALUMINUM	
1,2-DICHLOROPROPANE	ANTIMONY	
1,3,5-TRIMETHYLBENZENE	ARSENIC	
1,3-DICHLOROBENZENE	BARIUM	
1,3-DICHLOROPROPANE	BERYLLIUM	
1,4-DICHLOROBENZENE	CADMIUM	
2,2-DICHLOROPROPANE	CALCIUM	
2-CHLOROTOLUENE	CHROMIUM	
4-BROMOFLUOROBENZENE	COBALT	
4-CHLOROTOLUENE	COPPER	
BENZENE	IRON	
BROMOBENZENE	LEAD	
BROMOCHLOROMETHANE	LITHIUM	
BROMODICHLOROMETHANE	MAGNESIUM	
BROMOFORM	MANGANESE	
BROMOMETHANE	MERCURY	
CARBON TETRACHLORIDE	MOLYBDENUM	
CHLOROBENZENE	NICKEL	
CHLOROETHANE	POTASSIUM	
CHLOROFORM	SELENIUM	
CHLOROMETHANE	SILVER	
CIS-1,2-DICHLOROETHENE	SODIUM	
CIS-1,3-DICHLOROPROPENE	STRONTIUM	
DIBROMOCHLOROMETHANE	THALLIUM	
DIBROMOMETHANE	TIN	
DICHLORODIFLUOROMETHANE	URANIUM	
ETHYLBENZENE	VANADIUM	
HEXACHLOROBUTADIENE	ZINC	
ISOPROPYLBENZENE		
METHYLENE CHLORIDE		
N-BUTYLBENZENE		

The Rocky Flats Alluvium is 25 to 30 feet thick on the northwest, west, and southwest sides of the landfill, and 10 to 15 feet thick on the divides north and south of the landfill pond. Colluvium is 1 to 5 feet thick on the slopes around the East Landfill Pond and below the dam. The valley-fill alluvium ranges in thickness from 3 to 8 feet in the landfill area and becomes thicker downstream to the east. The thickness of artificial fill increases from about 5 feet at the perimeter of the landfill to about 45 feet near the centerline of the valley (DOE, 1996a). Weathered bedrock material thicknesses vary considerably in the vicinity of the landfill, ranging from approximately 4 to 35 feet, as indicated by weathered bedrock isopach mapping of the area (EG&G, 1995).

Average depth to groundwater ranges from 5 to 15 feet in surficial deposits (excluding artificial fill) (EG&G, 1995a). Within the landfill, groundwater is found at approximately 20 feet at the western end, 16 feet in the middle, and 33 feet at the eastern end (DOE, 1996a). The depth to groundwater in weathered bedrock is generally deeper than those of the overlying surficial deposits due to the presence of steep downward vertical gradients that are prevalent in bedrock materials. Saturated thickness of UHSU deposits vary widely across the landfill, with the thickest sections found in the Rocky Flats Alluvium at the western end, and thinnest sections found in colluvial and valley fill deposits east of the East Landfill Pond and in the Rocky Flats Alluvium along the south divide. EG&G (1995a) reported saturated thicknesses ranging from 0 to 20 feet for surficial deposits at the landfill.

Geometric mean hydraulic conductivities calculated from field tests of the different geologic units are given in Section 5.4.

5.2 Potentiometric Surface

Groundwater is present in surficial deposits and artificial fill, and in bedrock sandstones and claystones in the area of the Present Sanitary Landfill. Groundwater flow patterns in the UHSU tend to mimic the surface topography. Within landfill wastes, groundwater flows toward the center of the landfill, then flows eastward toward the East Landfill Pond. Outside the landfill,

groundwater generally flows eastward within saturated UHSU surficial deposits, except near stream valleys, which disrupt UHSU flow patterns and function as drains for UHSU groundwater. For example, near the East Landfill Pond, groundwater flows from the north, west, and south toward the pond because of its topographically low position in the No Name Gulch drainage. Groundwater entering the pond will mix with surface water and be discharged by evaporation, pumped to Pond A-3, and, to a limited extent, percolate downward into underlying bedrock materials or laterally through the dam. Any groundwater seeping past the dam into the lower drainage would flow eastward along the stream course until discharged via evapotranspiration, surface water, or as lateral subsurface flow at the Indiana Street east boundary.

Groundwater elevations are measured at least quarterly, and these elevations in the surficial deposits of the UHSU are characterized by seasonal variations of as much as 10 feet. The water-table elevation is generally lowest in late winter and early spring prior to recharge by snowmelt, and highest during June and July. Groundwater elevations in the weathered bedrock of the UHSU typically show seasonal variations of as much as 15 feet (DOE, 1992). Appendix A lists the results of depth to water measurements for wells monitored during 1997.

5.3 Vertical Hydraulic Gradients

Vertical hydraulic gradient is the quotient of the differences in water levels measured concurrently in two adjacent wells, and the vertical distance between the two measuring points, which are specified here as the midpoint of each screened interval. Vertical gradients were calculated at 12 well pairs in 1995. Only two of these pairs remained active since 1995. Examination of historic water level data indicates that hydraulic gradients remain generally consistent over time barring extreme climatic events. Therefore, the 1995 gradient calculations have been presented here to provide a more complete summary (Table 5-1). Wells with overlapping screened intervals were not used to calculate vertical hydraulic gradients.

With one exception (well pair 72393/72093 in the center of the landfill), the calculated vertical

Table 5-1
Vertical Hydraulic Gradients at the Present Sanitary Landfill

Well Pair ¹	Quarter	Vertical Hydraulic Gradient ^c (dh/dl)		
70093/70193 (UHSU alluvium to UHSU bedrock)	1st	ND		
	2nd	0 090	downward gradient	
	3rd	0 030	downward gradient	
	4th	0 024	downward gradient	
70193/70293 (UHSU bedrock to LHSU bedrock)	1st	ND		
	2nd	0 957	downward gradient	
	3rd	0 278	downward gradient	
	4th	0 151	downward gradient	
70493/70593 (UHSU bedrock to LHSU bedrock)	1st	ND		
	2nd	1 107	downward gradient	
	3rd	0 683	downward gradient	
	4th	0 419	downward gradient	
70693/70893 (UHSU alluvium to LHSU bedrock)	1st	ND		
	2nd	1 169	downward gradient	
	3rd	1 076	downward gradient	
	4th	0 932	downward gradient	
72393/72093 (UHSU alluvium to USHU alluvium)	1st	ND		
	2nd	-0 025	upward gradient	
	3rd	-0 040	upward gradient	
		-0 034	upward gradient	
1086/0986 (UHSU alluvium to LHSU bedrock)	1st	0 265	downward gradient	
	2nd	0 341	downward gradient	
	3rd	0 317	downward gradient	
	4th	0 291	downward gradient	
6487/B206189 (UHSU alluvium to UHSU bedrock)	1st	0 429	downward gradient	
	2nd	0 072	downward gradient	
	3rd	ND		
	4th	ND		
0786/0886 (UHSU alluvium to LHSU bedrock)	1st	0 559	downward gradient	
	2nd	0 739	downward gradient	
	3rd	0 631	downward gradient	
	4th	0 685	downward gradient	
B206989/B207089 (UHSU bedrock to UHSU bedrock)	1st	0 075	downward gradient	
	2nd	ND		
	3rd	0 098	downward gradient	
	4th	0 122	downward gradient	

¹UHSU = upper hydrostratigraphic unit

LHSU = lower hydrostratigraphic unit

²ND = no data value cannot be calculated

gradients were all directed downward. The calculated upward vertical gradient at 72393/72093 was approximately 0.020 to 0.026 for the first three quarters of 1995. Downward vertical gradients ranging from 0.022 to 1.099 were calculated for the remaining well pairs. In general, the magnitudes and directions of gradients measured at the landfill in 1995 were similar to those calculated for 1994.

5.4 Average Linear-Flow Velocities

The average linear groundwater-flow velocity was calculated for three flow-paths in UHSU surficial deposits and three flow-paths in UHSU bedrock in the vicinity of the Present Landfill for 1995. Most of the well pairs were deactivated in 1995. However, the variables used in calculating flow velocities (hydraulic conductivity, porosity, and hydraulic gradient) remain effectively constant over time. Hence, the following discussion excerpted from the 1995 report is considered indicative of current conditions in the Present Landfill.

Migration rates for conservative, dissolved constituents approximate the average linear groundwater-flow velocity, however, attenuated, volatile, biodegradable, or redox-sensitive species can exhibit migration rates much less than the average linear groundwater-flow velocity. Table 5-2 presents the calculated average linear velocities of groundwater flow during the first three quarters of 1995. The values of hydraulic conductivity used for surficial deposits and bedrock of the UHSU are the geometric means of hydraulic-conductivity values for each unit at the Present Landfill, and include results of historic slug tests (DOE, 1994). The value of hydraulic conductivity used for surficial deposits (including landfill wastes) is 1.1×10^{-4} cm/sec. RCRA reports prior to 1993 used a hydraulic-conductivity value of 3.1×10^{-4} to 3.8×10^{-4} cm/sec. The value of hydraulic conductivity used for bedrock of the UHSU is 5.33×10^{-7} cm/sec, which is also slightly lower than the value used in reports prior to 1993 (8.9×10^{-7} cm/sec). The assumed effective porosity for all units is 0.1 (DOE, 1991a). In 1995, the calculated flow velocities for groundwater in UHSU surficial materials were similar to those for 1994.

Table 5-2
Average Linear Flow Velocities at or Near the Present Landfill

Well Pair	Quarter	dh/dl ^a	K (cm/sec) ^b	n ^c	v (cm/sec) ^{a,d}	v (ft/yr) ^{a,d}
Alluvium						
B106089/72393	1 st	0 001	1 10x10 ⁻⁴	0 1	1 1x10 ⁻⁶	1 14
	2 nd	0 0001	1 10x10 ⁻⁴	0 1	1 1x10 ⁻⁷	0 11
	3 rd	0 007	1 10x10 ⁻⁴	0 1	7 7x10 ⁻⁶	7 97
	4 th	ND	1 10x10 ⁻⁴	0 1	ND	ND
72393/72293	1 st	0 044	1 10x10 ⁻⁴	0 1	4 8x10 ⁻⁵	50 12
	2 nd	0 043	1 10x10 ⁻⁴	0 1	4 7x10 ⁻⁵	48 98
	3 rd	0 046	1 10x10 ⁻⁴	0 1	5 1x10 ⁻⁵	52 40
	4 th	ND	1 10x10 ⁻⁴	0 1	ND	ND
72293/0786	1 st	0 116	1 10x10 ⁻⁴	0 1	1 3x10 ⁻⁴	132 13
	2 nd	0 128	1 10x10 ⁻⁴	0 1	1 4x10 ⁻⁴	145 80
	3 rd	0 123	1 10x10 ⁻⁴	0 1	1 4x10 ⁻⁴	140 10
	4 th	ND	1 10x10 ⁻⁴	0 1	ND	ND
Bedrock of the UHSU						
70493/B206789 ^e	1 st	0 037	5 33x10 ⁻⁷	0 1	2 0x10 ⁻⁷	0 20
	2 nd	0 037	5 33x10 ⁻⁷	0 1	2 0x10 ⁻⁷	0 20
	3 rd	0 039	5 33x10 ⁻⁷	0 1	2 1x10 ⁻⁷	0 22
	4 th	ND	5 33x10 ⁻⁷	0 1	ND	ND
B206789/B206989 ^e	1 st	0 077	5 33x10 ⁻⁷	0 1	4 1x10 ⁻⁷	0 42
	2 nd	0 077	5 33x10 ⁻⁷	0 1	4 1x10 ⁻⁷	0 42
	3 rd	0 084	5 33x10 ⁻⁷	0 1	4 5x10 ⁻⁷	0 46
	4 th	ND	5 33x10 ⁻⁷	0 1	ND	ND

Well Pair	Quarter	dh/dl ^a	K (cm/sec) ^b	n ^c	v (cm/sec) ^{a,d}	v (ft/yr) ^{a,d}
B206989/4287 ^e	1 st	ND	5.33x10 ⁻⁷	0.1	ND	ND
	2 nd	0.012	5.33x10 ⁻⁷	0.1	6.4x10 ⁻⁸	0.07
	3 rd	0.013	5.33x10 ⁻⁷	0.1	6.9x10 ⁻⁸	0.07
	4 th	ND	5.33x10 ⁻⁷	0.1	ND	ND

^a ND = no data, value can not be calculated due to insufficient information or dry well

^b Geometric mean of hydraulic conductivity values at the Present Landfill (preliminary results of OU7 RFI/RI)

^c n = assumed effective porosity (EG&G, 1993)

^d v = Darcy velocity (average linear groundwater flow velocity)

^e = Gradient calculated under non-equilibrium conditions Reported values are given as estimates only

Calculated average linear-flow velocities in fill materials range from approximately 1 foot per year at the west end of the landfill to approximately 160 feet per year at the advancing eastern face of the landfill. Calculated average linear-flow velocities in UHSU bedrock at the Present Landfill ranged from approximately 0.20 feet to 0.22 feet per year beneath the landfill, to approximately 0.07 feet to 0.41 feet per year downgradient of the landfill. The calculated groundwater-flow velocities for UHSU bedrock in 1995 were similar to those reported in the 1994 Annual RCRA Groundwater Monitoring Report (DOE, 1995).

6.0 GROUNDWATER QUALITY AT THE PRESENT LANDFILL

The assessment of groundwater chemistry at the Present Landfill includes an evaluation of the spatial distribution of groundwater constituents in and around the landfill, a statistical evaluation of the chemistry of downgradient groundwater with respect to upgradient groundwater, as specified in 6 CCR 1007-2 and the IMP. Statistical comparisons between downgradient and upgradient groundwater data were made using the methodology described in the *1995 Annual RCRA Groundwater Monitoring Report* (DOE, 1996).

Due to the lack of water in downgradient wells, the majority of analytes had insufficient data to perform statistical analyses for 1997. Figures 4-1 through 4-4 depict the analytical results for each well in individual box-plots. To show as much data as possible without overcrowding, box-plots for metals include only those analytes for which the mean value was greater in downgradient wells than in upgradient wells. Box-plots for VOCs include all detected compounds for upgradient and downgradient wells. All data for radionuclides and water quality parameters are presented. Appendix B contains the analytical results for groundwater samples collected during 1997.

6.1 Spatial Distribution of Groundwater Constituents

6.1.1 Upgradient Wells

Currently, four wells (5887, 70193, 70393, and 70493) monitor groundwater chemistry in the UHSU immediately upgradient of the Present Landfill. Wells 5887 and 70393 are completed in UHSU alluvial materials and wells 70193 and 70493 are completed in UHSU bedrock.

Well 70493 contained trace amounts of 1,1,1-TCA and trichloroethene (0.5 and 0.8 µg/L, respectively). Well 5887 also had methylene chloride at a concentration near the detection limit (1.2 µg/L). These results are consistent with previous monitoring. Well 70393 had quantifiable results for 1,1,1-TCA, 1,1-DCE, tetrachloroethene, and trichloroethene (Figure 4-4). These compounds appear to be increasing very slightly compared with 1996 results. Carbon tetrachloride and methylene chloride were also present at concentrations near the detection limit for well 70393. Results for all other constituents monitored in upgradient wells were below detection.

6.1.2 Downgradient Wells

Three wells located east of the East Landfill Pond embankment have been used to monitor the chemistry of downgradient groundwater in the UHSU (wells 4087, B206989, and B207089). Note that well B207089 has been deactivated. Well B206989 monitors groundwater in the UHSU bedrock and well 4087 monitors groundwater quality in UHSU surficial materials. However, because the dam for the East Landfill Pond acts as a barrier to alluvial groundwater flow from the west, well 4087 is frequently dry. Three additional downgradient wells (52894, 52994, and 53094) were installed in 1994; these wells monitor groundwater in UHSU surficial materials, UHSU bedrock, and LHSU bedrock, respectively. Of these three, only 52894 yielded enough water to be sampled in 1997. All of the well locations are consistent with 6 CCR 1007-2, which allows alternate placement of monitoring wells downgradient of an interim-status facility where existing physical obstacles prevent installation of wells at the boundary.

Results for well 52894 show that concentrations of fluoride, sulfate, total dissolved solids, barium, copper, iron, lithium, manganese, selenium, strontium, and zinc exceed upgradient concentrations reported for wells 70393 and 5887 (Figures 4-1 and 4-2) None of the analytes contained in well 4087 samples exceeded the upgradient well concentrations Well B206989 was sampled for nitrate and tritium, with nitrate detected above upgradient concentrations Elevated concentrations of the non-hazardous metals sodium, potassium, calcium, and magnesium were also detected in downgradient wells, but have no ALF groundwater action levels and, consequently, are not shown in Figure 4-2 All other ALF groundwater constituents were detected at below upgradient concentration levels

Trend plots of analytes in downgradient wells that exceed upgradient concentrations are presented in Appendix C per the requirements of the IMP Concentration trends for analytes with three or more data points tend to be somewhat erratic, but are generally flat or declining, and therefore indicate that landfill groundwater is not currently migrating eastward at increased concentrations past the East Landfill dam Data sets consisting of one or two data points for some analytes are insufficient for discerning trends and can not be interpreted without additional data These trends will be reevaluated as more data becomes available from the groundwater monitoring program

Assuming that groundwater seepage past the dam is appreciable enough to influence downgradient groundwater quality, the elevated concentrations of inorganic analytes in downgradient groundwater can be explained by the evaporative concentration of solutes in pond water in combination with other factors, such mineral build-up in soils resulting from seasonal desaturation of valley-fill alluvial materials and contributions of more highly mineralized groundwater from the underlying LHSU Conversely, any groundwater VOC contributions to pond water will tend to be lost by volatilization before reaching the downgradient wells Analysis of analyte trends showing concentration increases must account for these conditions in order to differentiate between natural and anthropogenic influences

6 1 3 Other Landfill Wells

Wells 6687 and 76992 are located along the southern and southeastern perimeter of the landfill respectively Well 77393 is located south of the main access road and was consistently dry in 1997 Well 76992, which was consistently dry in 1996, was sampled twice in 1997 Results for 76992 showed no constituents to be present at concentrations exceeding upgradient concentrations Sample results for well 6687 show detectable concentrations for organic compounds 1,1,1-trichloroethane, 1,1-dichloroethene, carbon tetrachloride, and trichloroethene (Figure 4-4) The source of these VOCs is believed to be the plume associated with IHSSs upgradient of the landfill including the PU & D yard (IHSSs 170, 174A, and 174B) Investigative activities for this unit were completed in 1997 and results are discussed in Section 7 0

6.2 Statistical Evaluation of Groundwater Constituents

Where possible, analytical data for groundwater monitored upgradient of the Present Landfill were compared statistically to analytical data for groundwater sampled from compliance-boundary wells located downgradient of the Present Landfill Results of these comparisons were used to evaluate potential contaminant releases from the regulated unit into the uppermost "aquifer" The comparisons between upgradient and downgradient groundwater quality were made using the statistical methodology discussed in the 1995 Annual RCRA Report (DOE, 1996)

Statistical comparisons were not performed for analytes with less than 50-percent quantifiable results or for analytes with less than three quantifiable results Therefore, dissolved metals and uranium isotopes could not be statistically evaluated because only one sample for each of these analyte types could be obtained from downgradient locations (well 52894) in 1997 Similarly, water quality parameters including fluoride, sulfate, and total dissolved solids had insufficient data for statistical evaluation Data for volatile organic compounds met the volume criteria to be evaluated However, no organic compounds were detected in any downgradient wells in 1997 (< 50% detections), so these compounds were not included in statistical evaluation

For analytes with greater than 50-percent quantifiable results, ANOVA testing was performed. All UHSU results (alluvial and bedrock) were grouped to provide adequate data to perform statistical tests. Even so, data were sufficient in number to evaluate only nitrate and tritium statistically. Test results indicated no statistically significant difference (at the 5-percent significance level) in upgradient versus downgradient groundwater quality in the total UHSU for tritium and nitrate. ANOVA results are summarized in Table 6-1.

7.0 PU&D YARD GROUNDWATER PLUME INVESTIGATION

VOC groundwater contamination has historically been detected in well 70393 located at the upgradient periphery of the Present Landfill and in seep well point 61495 positioned along the north hillslope of North Walnut Creek. The presence of contamination in upgradient landfill groundwater indicates that non-landfill contaminants are currently or potentially entering the landfill representing a potential impact to downgradient landfill groundwater quality. Based on historical documentation, land usage, and hydrogeologic considerations, the most likely source of contamination to the groundwater in this area was tentatively identified as the Property Utilization and Disposal Storage Yard (PU&D Yard), also known as IHSS 170, including IHSSs 174A and 174B. These three IHSSs were former storage areas for empty drums, cargo boxes, and dumpsters from 1974 to 1994 that contained unknown residual quantities and types of solvents and waste materials. Two areas within IHSS 170, IHSSs 174A and 174B, were designated for the storage of hazardous materials, specifically empty drums at IHSS 174A and a dumpster for the storage of stainless steel sheet metal chips and lathe turnings coated with freon-based or oil-based lathe coolant. Potential VOC contamination is probably due to leaking drums containing oil-solvents or metal turnings coated with oil-solvents at the surface, or as surface spills.

Subsequent soil-gas and field sampling studies indicated the possible presence of subsurface VOC contamination in three areas, 1) the east-southeast side of IHSS 170, 2) the northeast corner of IHSS 170 and the north side of IHSS 174A, and 3) an oil stain area in IHSS 174B (RMRS, 1997). Based on these results and recent detections of VOCs in routine well samples, a pre-

Table 6-1
Comparative Statistics for the Present Sanitary Landfill UHSU (alluvial and bedrock wells)

Group	Analyte	P-value	Statistically Different? Y/N
Water Quality Parameters	Nitrate/Nitrite	0.37	N
Radionuclides	Tritium	0.52	N

Anova Single Factor Nitrate/Nitrite

SUMMARY

Groups	Count	Sum	Average	Variance
Column 1	4	42.31	10.58	411.48
Column 2	6	18.4	3.07	0.93

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	135.39	1	135.39	0.87	0.38	5.32
Within Groups	1239.06	8	154.88			
Total	1374.45	9				

Anova Single Factor Tritium

SUMMARY

Groups	Count	Sum	Average	Variance
Column 1	5	229	45.80	2466.20
Column 2	6	734	122.33	62490.67

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	15974.59	1	15974.59	0.45	0.52	5.12
Within Groups	322318.13	9	35813.13			
Total	338292.73	10				

NOTE Analytes must have > 50 percent detects and > 2 detects for statistical analysis

remedial field investigation of PU&D Yard soils and groundwater was undertaken in 1997 to confirm the identity of the PU&D Yard as a source for upgradient landfill groundwater contamination and characterize the source, extend, and pathways for VOC contamination in the area. Twelve new monitoring wells and well points were installed within and around the perimeter of the PU&D Yard and downgradient areas, as shown in Figure 7-1. In addition, groundwater grab samples were obtained for VOC analysis from six shallow borings during drilling positioned in IHSSs 174A and 174B, and near the west boundary of IHSS 170, as described in RMRS (1997). Completion details for the new PU&D Yard monitoring wells are presented in Table 7-1.

Table 7-2 presents the results of VOC groundwater sampling conducted at the PU&D Yard and surrounding area in wells 01097 through 02197 during September 1997. Detections of VOC compounds were found in all wells containing groundwater, including Tier II groundwater action level exceedances for trichloroethene (TCE) in wells 01497 and 02097, tetrachloroethene (PCE) in wells 01297 and 01397, and 1,1-dichloroethene (1,1-DCE) in wells 01497 and 01897. TCE, PCE, 1,1-DCE and 1,1,1-trichloroethane (1,1,1-TCA) were the most commonly detected compounds. The remaining compounds (carbon tetrachloride, chloroform, napthalene, 1,2-dichloroethene, toluene, and 1,2,4-trimethylbenzene) were reported mainly at below detection levels as estimated quantitations (J qualifier). Wells 01797 and 02197 were dry at the time of sampling.

Groundwater grab samples collected during IHSS 174A and 174B pre-remedial drilling activities revealed the presence of PCE Tier I and II groundwater action level exceedances in boreholes 17497 (1,700 µg/L) and 18197 (15 µg/L), respectively, as reported in RMRS (1997). Borehole 17497 is located at the north edge of IHSS 174A, which appears to be a potential source for groundwater PCE contamination. However, the presence of relatively low concentration PCE and other VOC detections in many wells (including borehole 18197) located up and sidegradient of IHSS 174A indicates that the PU&D Yard might be acting as a diffuse (non-point) source for groundwater contamination.

Table 7-1 PU&D Yard Groundwater Monitoring Wells Installed in 1997

Well	Drilling Method	Date Completed	Completion	Casing	Screen Top (ft)	Screen Bottom (ft)	Well Depth (ft)
01097	Hollow Stem Auger	7/16/97	Alluvium	2-inch ID PVC	19 8	39 8	42 5
01197	Hollow Stem Auger	7/18/97	Alluvium	2-inch ID PVC	13 0	28 0	30 0
01297	Hollow Stem Auger	7/22/97	Alluvium	2-inch ID PVC	14 0	34 0	36 0
01397	Hollow Stem Auger	8/6/97	Alluvium/bedrock	2-inch ID PVC	7 2	22 2	24 2
01497	Hollow Stem Auger	7/23/97	Alluvium	2-inch ID PVC	13 0	23 1	25 0
01597	Hollow Stem Auger	7/28/97	Alluvium	2-inch ID PVC	14 6	29 6	31 6
01697	Geoprobe	8/27/97	Alluvium	0 75-inch ID PVC	18 5	28 2	28 4
01797	Hollow Stem Auger	9/3/97	Alluvium	2-inch ID PVC	12 0	22 0	24 0
01897	Geoprobe	8/13/97	Alluvium	0 75-inch ID PVC	13 0	22 8	23 0
01997	Hollow Stem Auger	9/9/97	Alluvium	2-inch ID PVC	7 0	12 0	14 0
02097	Geoprobe	8/20/97	Alluvium	0 75-inch ID PVC	7 0	11 9	12 1
02197	Hollow Stem Auger	9/9/97	Alluvium	2-inch ID PVC	5 9	10 9	12 9

Table 7-2 Detected Volatile Organic Compounds in Groundwater (ug/L)
PU&D Yard Monitoring Wells

WELL	Sample Date	Sample Number	TCE	PCE	Tetrachloride	Chloroform	Naphthalene	cis-1,2 DCE	1,1 DCE	1,1,1 TCA	Toluene	1,2,4 Trimethylbenzene
01097	9/25/97	GW05613TE	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	0.4 J	0.3 J
01197	9/29/97	GW05619TE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
01297	9/25/97	GW05616TE	1 U	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
01397	9/30/97	GW05620TE	0.2 J	5	0.2 J	1 U	0.4 JB	1 U	1 U	5	1 U	1 U
01497	9/25/97	GW05614TE	30	4 J	5 J	6 U	6 U	80	3 J	170	6 U	6 U
01597	9/26/97	GW05617TE	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
01697	9/30/97	GW05623TE	4	0.5 J	1 U	1 U	1 U	1 U	2	1 U	4	1 U
01797							Dry - sample not collected					
01897	9/29/97	GW05622TE	4	0.6 J	0.8 J	0.3 J	1 U	1 U	7	1 U	20	1 U
01997	9/30/97	GW05621TE	2	4	1 U	1 U	1 U	1 U	2	1 U	6	1 U
02097	9/30/97	GW05618TE	10	2	1 U	0.4 J	1 U	0.8 J	2	3	7	1 U
02197							Dry - sample not collected					

Note: U = Analyzed chemical was not detected

J = Estimated result chemical detected below SCL

B = Chemical also found in method blank

As shown in Figure 7-2, the distribution of VOC contamination in groundwater (composite plume consisting of greater than Tier II concentration levels of TCE, PCE, 1,2-DCE, and vinyl chloride) confirm that the PU&D Yard is the probable source of upgradient landfill VOC contamination. The relatively high concentration of TCE (30 µg/L) in well 01497, located approximately 200 feet upgradient of landfill background well 70393 and 400 feet of the landfill boundary, and PCE (1,700 µg/L) in borehole 17497, indicates that VOC contamination probably originates near the north boundary of the Yard. From the PU&D Yard, the plume is observed to migrate longitudinally eastward along the south boundary of the landfill and laterally to the south, where alluvial groundwater containing plume contaminants discharge to the North Walnut Creek drainage as hillside seeps (i.e., well 61495) and shallow subsurface flow. Considering the fact that groundwater once discharged to the No Name Gulch valley headcut (indicated by seepage areas present in a 1937 aerial photograph) now filled with landfill refuse, the shape and orientation of the plume strongly suggests that plume migration is, at least partially, influenced by interaction with groundwater control structures (groundwater-intercept and slurry wall system) and diverted around the landfill. A comparison of VOC compounds from the PU&D Yard investigation was made with data reported in recent RCRA groundwater reports (e.g. DOE, 1995, 1996). The data suggest that the chlorinated organic compounds observed in the PU&D Yard plume are prevalent in landfill wells located south of the groundwater intercept system, while organic compounds found within the boundaries of the intercept system show more variable organic affinities (DOE, 1995, 1996). Of special note is the presence of 1,1,1-trichloroethane, which is a good indicator compound for PU&D Yard contamination. This compound is detected in wells south of the intercept system but not in wells within the intercept boundaries. Validation of these observations will be done as part of the ongoing plume evaluation project. The potential incursion of PU&D Yard plume contaminants into the landfill and the apparent extent of the PU&D Yard plume beyond the east face of the landfill indicates a potential impact to downgradient monitoring well quality that must be considered when evaluating future compliance with post-closure permitting requirements.

8.0 MONITORING WELL ABANDONMENT AND REPLACEMENT ACTIVITY

Twenty-four wells were abandoned at the Present Landfill as part of the 1997 Well Abandonment and Replacement Program using the procedures specified in OP GT 11, *Plugging and Abandonment of Wells* (EG&G, 1992). These wells, located within the boundary of the proposed final cover, were abandoned in advance of landfill closure in accordance with an EG&G proposal approved by CDPHE and EPA (CDPHE, 1995). All wells were abandoned using in-place methods accomplished by grouting the casing in-place to a depth of three feet below grade, removing the surface casing, protective casing and concrete well pads to a depth of three feet, capping the remaining well casing with a locking J-cap, and backfilling the hole with clean soil. Figure 8-1 illustrates the location of landfill wells abandoned in 1997. Well abandonment information is summarized in Table 8-1.

**TABLE 8-1
WELL ABANDONMENT SUMMARY**

Well Number	Completion Zone	Screened Interval (ft)	Abandonment Method	Reason
0786	Alluvium	3 0-5 7	In Place	Landfill closure
0886	Bedrock	59 1-63 8	In Place	Landfill closure
6187	Alluvium	3 5-28 2	In Place	Landfill closure
6287	Alluvium	3 5-26 6	In Place	Landfill closure
6487	Alluvium	13 0-23 3	In Place	Landfill closure
6587	Bedrock	10 7-24 0	In Place	Landfill closure
6687	Alluvium	3 4-18 0	In Place	Obstruction, replaced with well 00597
7087	Bedrock	3 5-16 3	In Place	Landfill closure
7287	Alluvium	3 5-6 8	In Place	Landfill closure
B106089	Alluvium	3 7-23 2	In Place	Landfill closure
B206289	Bedrock	32 4-41 8	In Place	Landfill closure
B206489	All/Bdrk	3 3-10 0	In Place	Landfill closure
B206589	Bedrock	23 5-35 1	In Place	Landfill closure
B206789	Bedrock	9 8-19 3	In Place	Landfill closure
00393	Alluvium	4 0-14 0	In Place	Landfill closure
00493	Alluvium	5 9-8 9	In Place	Landfill closure
71193	Alluvium	10 0-20 0	In Place	Landfill closure
71493	Alluvium	18 8-22 8	In Place	Landfill closure
71693	Alluvium	16 3-26 3	In Place	Landfill closure
71893	Alluvium	10 7-25 7	In Place	Landfill closure
72093	Alluvium	44 9-49 9	In Place	Landfill closure
72293	Alluvium	27 6-32 6	In Place	Landfill closure
72393	Alluvium	26 6-36 6	In Place	Landfill closure
72493	Alluvium	17 9-27 9	In Place	Landfill closure

RFCA monitoring well 6687, abandoned due to a partial downhole casing obstruction, was replaced by well 00597 (see Figure 7-1), located approximately 20 feet away. This well was constructed to monitor the same zone as well 6687 and is scheduled for regular sampling as prescribed under the Integrated Monitoring Plan (DOE, 1997).

9.0 CONCLUSIONS

Groundwater in the vicinity of the Present Landfill generally flows to the east, with the flow components converging toward the East Landfill Pond. Groundwater discharging from the landfill then mixes with pond water where it either evaporates or is pumped to Pond A-3 via the Pond A-1 bypass for eventual discharge from the Site. Subsurface leakage from the pond is also expected to occur, although the quantity of leakage is expected to be small based on the low hydraulic conductivity measured for the underlying bedrock materials. Groundwater in the drainage east of the dam flows to the east along the stream course and eventually is discharged from the Site via evapotranspiration, surface water, or as lateral subsurface flow.

The potentiometric surface configuration for the landfill based on 1994 groundwater elevations suggests that the groundwater-diversion system performs more effectively on the southwest side of the landfill than on the northwest side. It is believed that these general physical characteristics of the groundwater system change little over time barring dramatic climatic or geologic events and remain applicable for this and future reports. A preliminary evaluation of diversion system function will be undertaken in FY99.

Groundwater conditions at the Present Landfill in 1997 appear to be generally consistent with those of 1996. Due to the lack of water in downgradient wells, there were insufficient data to perform statistical analyses for most analytes in 1997. Statistical comparisons of upgradient versus downgradient UHSU groundwater at the Present Landfill were performed, however, for tritium and nitrate. Neither of these constituents displayed statistically significant differences when compared using ANOVA.

Analytes and concentration ranges detected in UHSU groundwater downgradient of the landfill were consistent with those found in 1996. Examination of the concentration ranges presented in Table 6-2 indicates that fluoride, sulfate, total dissolved solids, barium, copper, iron, lithium, manganese, selenium, strontium, nitrate, and zinc are elevated in one or more downgradient versus upgradient wells. The trends of these analytes, however, do not appear to be increasing with time. Tritium and certain VOCs were detected at concentrations in upgradient wells that exceeded the downgradient well concentrations. Based on these data, it is evident that the Present Landfill currently has no groundwater quality excursions reportable under the IMP. The impact of landfill refuse on uppermost aquifer groundwater quality below the facility appears to be minimal based on 1997 groundwater monitoring program results.

As discussed in Section 4.0, the site groundwater-monitoring network has been revised, which resulted in fewer wells sampled at the Present Landfill during 1997. Although the number of wells evaluated for this and future Present Landfill reports is less than that of 1995 and earlier reports, the current well network contains a sufficient number of upgradient and downgradient wells to meet or exceed regulatory requirements. Quarterly sampling has been recommended for landfill wells in the 1998 update to the Integrated Monitoring Plan to increase the number of samples for statistical comparisons.

VOC contaminants detected in monitoring wells southeast of the Present Landfill may be due to an inadequately functioning groundwater-intercept system in this area, emplacement of wastes beyond the limit of the intercept system, or impacts associated with other IHSSs adjacent to the landfill. At the present time, the results of the PU&D yard pre-remedial investigation implicate the PU&D Yard (IHSS 170, 174A, and 174B) as the most likely source of contamination in these wells based on consideration of plume composition and extent.

Notable accomplishments made at the Present Landfill for 1997 included operation of the leachate seep collection and treatment system, abandonment of 24 wells within the Present Landfill in advance of closure, and investigation of PU&D Yard groundwater contamination. Based on the uncertainty associated with operation of the landfill groundwater intercept system, additional

investigation will be conducted in fiscal year 1999 to gain a further understanding of system function as it relates to landfill operation and monitoring. This investigation will consist of a records search to locate relevant documentation concerning intercept system design, installation, and operation, and periodic flow monitoring and sampling of drain outflows located east of the East Landfill Pond dam to assess drain function and potentially identify the groundwater source.

10.0 REFERENCES

- CDPHE, 1995 Letter from J Schieffelin, CDPHE, to S Slaten, DOE-RFFO, OU 7 Area Well Abandonment Proposal, dated February 13, 1995
- DOE, 1990 1989 Annual RCRA Groundwater Monitoring Report for Regulated Units at the Rocky Flats Plant, Golden, Colorado March 1, 1990
- DOE, 1991 1990 Annual RCRA Groundwater Monitoring Report for Regualted Units at Rocky Flats Plant Golden, Colorado March 1, 1991
- DOE, 1991a Phase I RFI/RI Work Plan for Operable Unit No 7 - Present Sanitary Landfill (IHSS No 114) and the Inactive Hazardous Waste Storage Area (IHSS No 203) (Operable Unit No 7) U S Department of Energy, Rocky Flats Plant, Golden, Colorado August 1991
- DOE, 1992 Final Groundwater Assessment Plan U S Department of Energy, Rocky Flats Plant, Golden, Colorado February 1992
- DOE, 1992a 1991 Annual RCRA Groundwater Monitoring Report for Regulated Units at Rocky Flats Plant, Golden, Colorado March 1, 1992
- DOE, 1993 1992 Annual RCRA Groundwater Monitoring Report for Regulated Units at Rocky Flats Plant, Golden, Colorado February 25, 1993
- DOE, 1994 1993 Annual RCRA Groundwater Monitoring Report for Regulated Units at Rocky Flats Plant, Golden, Colorado February 23, 1994
- DOE, 1995 1994 Annual RCRA Groundwater Monitoring Report for Regulated Units at Rocky Flats Plant, Golden, Colorado February, 1995
- DOE, 1996 1995 Annual RCRA Groundwater Monitoring Report for Regulated Units at Rocky Flats Plant, Golden, Colorado February 29, 1996
- DOE, 1996a Phase I IM/IRA Decision Document and Closure Plan for Operable Unit 7 Present Landfill Rocky Flats Environmental Technology Site, Golden, Colorado March, 1996
- DOE, 1997 Draft Integrated Monitoring Plan Rocky Flats Environmental Technology Site Golden, Colorado January, 1997

EG&G, 1993 Background Geochemical Characterization Report EG&G Rocky Flats, Inc ,
Golden, Colorado September 1993

EG&G, 1993a Groundwater Geochemistry of Rocky Flats Plant EG&G Rocky Flats, Inc ,
Golden, Colorado December 1993

EG&G, 1995 Geologic Characterization Report Volume 1 of the Sitewide Geoscience
Characterization Study EG&G Rocky Flats, Inc Golden, Colorado February, 1995

EG&G, 1995a Hydrogeologic Characterization Report Volume 2 of the Sitewide Geoscience
Characterization Study EG&G Rocky Flats, Inc Golden, Colorado February, 1995

EG&G, 1995b Groundwater Geochemistry Report Volume 3 of the Sitewide Geoscience
Characterization Study EG&G Rocky Flats, Inc Golden, Colorado February, 1995

RFCA, 1996 Final Rocky Flats Cleanup Agreement, U S Department of Energy, Colorado
Department of Health and Environment, U S Environmental Protection Agency, July, 1996

RMRS, 1997 Data Summary Report for IHSSs 170, 174A, and 174B, Property Utilization and
Storage Yard, RF/RMRS-97-080 UN, September 25, 1997

Appendix A: Water Level Measurements

Appendix A
Water Level Measurements from Wells near the Present Sanitary Landfill - 1997

Location	Date	Measured Depth	Top of Casing	Water Elevation
4087	07-Jan-97	DRY	5884 61	DRY
4087	04-Feb-97	DRY	5884 61	DRY
4087	04-Mar-97	4 32	5884 61	5880 29
4087	10-Apr-97	4 4	5884 61	5880 21
4087	06-May-97	2 43	5884 61	5882 18
4087	03-Jun-97	5 05	5884 61	5879 56
4087	08-Jul-97	6 3	5884 61	5878 31
4087	09-Sep-97	7 19	5884 61	5877 42
4087	09-Oct-97	DRY	5884 61	DRY
4087	05-Nov-97	3 29	5884 61	5881 32
4087	02-Dec-97	2 32	5884 61	5882 29
52894	07-Jan-97	6 91	5870 75	5863 84
52894	14-Apr-97	6 56	5870 75	5864 19
52894	08-Jul-97	DRY	5870 75	DRY
52894	09-Oct-97	5 73	5870 75	5865 02
52894	18-Nov-97	3 93	5870 75	5866 82
52994	07-Jan-97	DRY	5873 81	DRY
52994	14-Apr-97	DRY	5873 81	DRY
52994	08-Jul-97	DRY	5873 81	DRY
52994	09-Oct-97	DRY	5873 81	DRY
5887	07-Jan-97	13 89	5996 77	5982 88
5887	10-Apr-97	10 44	5996 77	5986 33
5887	08-Jul-97	9 43	5996 77	5987 34
5887	29-Jul-97	10 68	5996 77	5986 09
5887	08-Oct-97	10 73	5996 77	5986 04
6687	07-Jan-97	13 26	5983 67	5970 41
6687	11-Apr-97	11 04	5983 67	5972 63
6687	08-Jul-97	11 03	5983 67	5972 64
70193	07-Jan-97	14 76	5992	5977 24
70193	10-Apr-97	13 24	5992	5978 76
70193	08-Jul-97	12 08	5992	5979 92
70193	17-Sep-97	12 26	5992	5979 74
70193	09-Oct-97	12 84	5992	5979 16
70393	07-Jan-97	13 83	6000 1	5986 27
70393	10-Apr-97	11 71	6000 1	5988 39
70393	08-Jul-97	8 53	6000 1	5991 57
70393	31-Jul-97	10 35	6000 1	5989 75
70393	08-Oct-97	10 05	6000 1	5990 05
70493	07-Jan-97	13 92	6000	5986 08
70493	10-Apr-97	13 24	6000	5986 76
70493	08-Jul-97	9 14	6000	5990 86
70493	11-Sep-97	8 2	6000	5991 8
70493	08-Oct-97	9 73	6000	5990 27
76992	07-Jan-97	DRY	5958	DRY
76992	10-Apr-97	13 15	5958	5944 85
76992	08-Jul-97	11 02	5958	5946 98
76992	09-Oct-97	11 5	5958	5946 5
76992	18-Nov-97	10 66	5958	5947 34
B206989	07-Jan-97	20 26	5884 32	5864 06
B206989	10-Apr-97	23	5884 32	5861 32
B206989	08-Jul-97	21 17	5884 32	5863 15
B206989	24-Sep-97	20 11	5884 32	5864 21
B206989	09-Oct-97	23 5	5884 32	5860 82

Appendix B: Groundwater Analytical Data

Appendix B: Groundwater Analytical Data
Dissolved Metals

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
52894	GW05541TE	6/16/97	ALUMINUM	8 8	8 8	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	ANTIMONY	2 2	2 2	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	ARSENIC	2	2	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	BARIUM	107	0 1	UG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	BERYLLIUM	0 2	0 2	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	CADMIUM	0 82	0 2	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	CALCIUM	62800	3 3	UG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	CHROMIUM	2 3	0 4	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	COBALT	1 8	0 7	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	COPPER	2 6	0 4	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	IRON	57	9 2	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	LEAD	1 2	1 2	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	LITHIUM	148	1 9	UG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	MAGNESIUM	19100	5 8	UG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	MANGANESE	162	0 1	UG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	MERCURY	0 03	0 03	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	MOLYBDENUM	9 4	2 7	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	NICKEL	3	0 6	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	POTASSIUM	3100	30 6	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	SELENIUM	4 8	2 3	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	SILVER	0 7	0 7	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	SODIUM	188000	40	UG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	STRONTIUM	567	0 4	UG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	THALLIUM	3 8	3 6	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	TIN	10 1	10 1	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	URANIUM	70 3	70 3	UG/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	VANADIUM	0 92	0 6	UG/L	B	DOWNGRADIENT
52894	GW05541TE	6/16/97	ZINC	9 6	0 6	UG/L	B	DOWNGRADIENT
52894	GW05727TE	11/18/97	ALUMINUM	42 1	24 4	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	ANTIMONY	1 3	1 3	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	ARSENIC	2 1	2 1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	BARIUM	87 6	0 4	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	BERYLLIUM	0 3	0 3	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CADMIUM	0 3	0 3	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CALCIUM	55800	7 6	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	CHROMIUM	0 6	0 6	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	COBALT	1 2	0 8	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	COPPER	1 7	1 3	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	IRON	11 3	11 3	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	LEAD	1 3	1 3	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	LITHIUM	141	2 5	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	MAGNESIUM	18700	9	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	MANGANESE	85	0 4	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	MERCURY	0 1	0 1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	MOLYBDENUM	5	0 6	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	NICKEL	1 8	0 6	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	POTASSIUM	2490	23 8	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	SELENIUM	2	2	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	SILVER	0 7	0 7	UG/L	U	DOWNGRADIENT

Present Sanitary Landfill - 1997

Appendix B Groundwater Analytical Data
Dissolved Metals

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
52894	GW05727TE	11/18/97	SODIUM	177000	189	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	STRONTIUM	574	0 4	UG/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	THALLIUM	1 9	1 9	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TIN	2 4	2 4	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	VANADIUM	0 8	0 8	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	ZINC	6 3	0 9	UG/L		DOWNGRADIENT
5887	GW05469TE	1/31/97	ALUMINUM	18 2	200	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	ANTIMONY	21 7	60	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	ARSENIC	3 9	10	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BARIUM	69 8	200	UG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	BERYLLIUM	1 5	5	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CADMUM	5	5	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CALCIUM	21000	5000	UG/L		UPGRADIENT
5887	GW05469TE	1/31/97	CESIUM	200	1000	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CHROMIUM	4 8	10	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	COBALT	5 3	50	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	COPPER	2 2	25	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	IRON	22 4	100	UG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	LEAD	3	5	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	LITHIUM	5 8	100	UG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	MAGNESIUM	4340	5000	UG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	MANGANESE	6	15	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	MERCURY	0 2	0 2	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	MOLYBDENUM	9 3	200	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	NICKEL	13 2	40	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	POTASSIUM	948	5000	UG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	SELENIUM	3 7	5	UG/L	U*	UPGRADIENT
5887	GW05469TE	1/31/97	SILICON	12400	100	UG/L		UPGRADIENT
5887	GW05469TE	1/31/97	SILVER	2 7	10	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	SODIUM	11500	5000	UG/L		UPGRADIENT
5887	GW05469TE	1/31/97	STRONTIUM	134	200	UG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	THALLIUM	4 5	10	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	TIN	17 8	200	UG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	VANADIUM	2 6	50	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	ZINC	10 4	20	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	ALUMINUM	23 6	23 6	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	ANTIMONY	3 4	3 4	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	ARSENIC	2 6	2 6	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BARIUM	64 6	0 1	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	BERYLLIUM	0 4	0 4	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	CADMUM	0 4	0 4	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CALCIUM	20300	2 8	UG/L		UPGRADIENT
5887	GW05571TE	7/29/97	CHROMIUM	0 9	0 9	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	COBALT	0 9	0 9	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	COPPER	1 4	0 9	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	IRON	16 7	16 7	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	LEAD	1 6	1 6	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	LITHIUM	2 2	1 5	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	MAGNESIUM	4510	10 4	UG/L	B	UPGRADIENT

Present Sanitary Landfill - 1997

Appendix B Groundwater Analytical Data

Dissolved Metals

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
5887	GW05571TE	7/29/97	MANGANESE	4	0 2	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	MERCURY	0 03	0 03	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	MOLYBDENUM	12 9	12 9	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	NICKEL	3 9	1	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	POTASSIUM	909	83 5	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	SELENIUM	2 7	2 7	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	SILVER	1 2	1 2	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	SODIUM	7710	4 9	UG/L		UPGRADIENT
5887	GW05571TE	7/29/97	STRONTIUM	121	0 3	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	THALLIUM	3 5	2 2	UG/L	B	UPGRADIENT
5887	GW05571TE	7/29/97	TIN	15 2	15 2	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	URANIUM	70 3	70 3	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	VANADIUM	0 9	0 9	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	ZINC	6 2	0 9	UG/L	B	UPGRADIENT
6687	GW05550TE	6/25/97	ALUMINUM	8 8	8 8	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	ANTIMONY	2 2	2 2	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	ARSENIC	2	2	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	BARIUM	11	0 1	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	BERYLLIUM	0 2	0 2	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	CADMUM	0 2	0 2	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	CALCIUM	179000	3 3	UG/L		S PERIMETER
6687	GW05550TE	6/25/97	CHROMIUM	3 3	0 4	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	COBALT	0 7	0 7	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	COPPER	14 5	0 4	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	IRON	25 3	9 2	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	LEAD	1 2	1 2	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	LITHIUM	10 8	1 9	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	MAGNESIUM	40000	5 8	UG/L		S PERIMETER
6687	GW05550TE	6/25/97	MANGANESE	1	0 1	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	MERCURY	0 03	0 03	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	MOLYBDENUM	4 9	2 7	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	NICKEL	11 4	0 6	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	POTASSIUM	2910	30 6	UG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	SELENIUM	2 3	2 3	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	SILVER	0 7	0 7	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	SODIUM	23200	4	UG/L		S PERIMETER
6687	GW05550TE	6/25/97	STRONTIUM	822	0 4	UG/L		S PERIMETER
6687	GW05550TE	6/25/97	THALLIUM	3 6	3 6	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	TIN	10 1	10 1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	URANIUM	70 3	70 3	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	VANADIUM	0 6	0 6	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	ZINC	38 4	0 6	UG/L		S PERIMETER
70193	GW05548TE	9/17/97	ALUMINUM	31 1	28 6	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	ANTIMONY	1 9	1 9	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	ARSENIC	2 5	2 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	BARIUM	87 1	0 3	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	BERYLLIUM	0 3	0 3	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CADMUM	0 4	0 4	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CALCIUM	23200	28 7	UG/L		UPGRADIENT

Present Sanitary Landfill - 1997

Appendix B Groundwater Analytical Data
Dissolved Metals

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
70193	GW05548TE	9/17/97	CHROMIUM	0 7	0 7	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	COBALT	0 7	0 7	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	COPPER	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	IRON	16 1	16 1	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	LEAD	1 7	1 5	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	LITHIUM	7	2 5	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	MAGNESIUM	4930	28 6	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	MANGANESE	1 1	0 6	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	MERCURY	0 1	0 1	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	MOLYBDENUM	1 2	0 5	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	NICKEL	1 2	0 8	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	POTASSIUM	1370	20 6	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	SELENIUM	2 7	2 2	UG/L	B	UPGRADIENT
70193	GW05548TE	9/17/97	SILVER	0 6	0 6	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	SODIUM	12700	205	UG/L		UPGRADIENT
70193	GW05548TE	9/17/97	STRONTIUM	158	0 4	UG/L		UPGRADIENT
70193	GW05548TE	9/17/97	THALLIUM	2 1	2 1	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TIN	1 8	1 8	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	VANADIUM	0 8	0 8	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	ZINC	4 2	0 4	UG/L	B	UPGRADIENT
70393	GW05452TE	1/23/97	ALUMINUM	18 2	200	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	ANTIMONY	21 7	60	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	ARSENIC	3 9	10	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BARIUM	55 9	200	UG/L	B	UPGRADIENT
70393	GW05452TE	1/23/97	BERYLLIUM	1 5	5	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CADMUM	5	5	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CALCIUM	18600	5000	UG/L		UPGRADIENT
70393	GW05452TE	1/23/97	CESIUM	200	1000	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CHROMIUM	4 8	10	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	COBALT	5 3	50	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	COPPER	2 2	25	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	IRON	19 6	100	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	LEAD	3	5	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	LITHIUM	9 3	100	UG/L	B	UPGRADIENT
70393	GW05452TE	1/23/97	MAGNESIUM	3860	5000	UG/L	B	UPGRADIENT
70393	GW05452TE	1/23/97	MANGANESE	6	15	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	MERCURY	0 2	0 2	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	MOLYBDENUM	9 3	200	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	NICKEL	13 2	40	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	POTASSIUM	613	5000	UG/L	B	UPGRADIENT
70393	GW05452TE	1/23/97	SELENIUM	3 7	5	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	SILICON	12500	100	UG/L		UPGRADIENT
70393	GW05452TE	1/23/97	SILVER	2 7	10	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	SODIUM	13100	5000	UG/L		UPGRADIENT
70393	GW05452TE	1/23/97	STRONTIUM	98 1	200	UG/L	B	UPGRADIENT
70393	GW05452TE	1/23/97	THALLIUM	4 5	10	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	TIN	16 6	200	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	VANADIUM	2 6	50	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	ZINC	6 4	20	UG/L	U	UPGRADIENT

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Appendix B Groundwater Analytical Data

Dissolved Metals

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
70393	GW05547TE	7/31/97	ALUMINUM	23 6	23 6	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	ANTIMONY	3 4	3 4	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	ARSENIC	2 6	2 6	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BARIUM	55 6	0 1	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	BERYLLIUM	0 42	0 4	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	CADMUM	0 4	0 4	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	CALCIUM	19000	2 8	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	CHROMIUM	0 9	0 9	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	COBALT	0 9	0 9	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	COPPER	0 9	0 9	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	IRON	16 7	16 7	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	LEAD	1 6	1 6	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	LITHIUM	3 6	1 5	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	MAGNESIUM	3950	10 4	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	MANGANESE	4 1	0 2	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	MERCURY	0 03	0 03	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	MOLYBDENUM	12 9	12 9	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	NICKEL	2 5	1	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	POTASSIUM	482	83 5	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	SELENIUM	2 7	2 7	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	SILVER	1 2	1 2	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	SODIUM	12000	4 9	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	STRONTIUM	104	0 3	UG/L	B	UPGRADIENT
70393	GW05547TE	7/31/97	THALLIUM	2 2	2 2	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	TIN	15 2	15 2	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	URANIUM	70 3	70 3	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	VANADIUM	0 9	0 9	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	ZINC	2	0 9	UG/L	B	UPGRADIENT
70493	GW05546TE	9/11/97	ALUMINUM	48 9	28 6	UG/L	B	UPGRADIENT
70493	GW05546TE	9/11/97	ANTIMONY	1 9	1 9	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	ARSENIC	2 5	2 5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	BARIUM	96 6	0 3	UG/L	B	UPGRADIENT
70493	GW05546TE	9/11/97	BERYLLIUM	0 3	0 3	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CADMUM	0 4	0 4	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CALCIUM	28800	28 7	UG/L		UPGRADIENT
70493	GW05546TE	9/11/97	CHROMIUM	0 7	0 7	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	COBALT	0 7	0 7	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	COPPER	0 5	0 5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	IRON	16 1	16 1	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	LEAD	1 5	1 5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	LITHIUM	12 7	2 5	UG/L	B	UPGRADIENT
70493	GW05546TE	9/11/97	MAGNESIUM	7100	28 6	UG/L		UPGRADIENT
70493	GW05546TE	9/11/97	MANGANESE	0 6	0 6	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	MERCURY	0 1	0 1	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	MOLYBDENUM	1 4	0 5	UG/L	B	UPGRADIENT
70493	GW05546TE	9/11/97	NICKEL	0 8	0 8	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	POTASSIUM	1600	20 6	UG/L	B	UPGRADIENT
70493	GW05546TE	9/11/97	SELENIUM	2 2	2 2	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	SILVER	0 6	0 6	UG/L	U	UPGRADIENT

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Appendix B: Groundwater Analytical Data
Dissolved Metals

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
70493	GW05546TE	9/11/97	SODIUM	15700	205	UG/L		UPGRADIENT
70493	GW05546TE	9/11/97	STRONTIUM	222	0 4	UG/L		UPGRADIENT
70493	GW05546TE	9/11/97	THALLIUM	2 1	2 1	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TIN	1 8	1 8	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	VANADIUM	0 8	0 8	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	ZINC	4 9	0 4	UG/L	B	UPGRADIENT
76992	GW05549TE	5/21/97	ALUMINUM	34 8	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	ANTIMONY	0 65	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	ARSENIC	0 65	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	BARIUM	48 4	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	BERYLLIUM	0 3	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	CADMUM	0 05	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	CALCIUM	40900	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	CHROMIUM	1 1	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	COBALT	0 5	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	COPPER	0 8	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	IRON	13 4	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	LEAD	1	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	MAGNESIUM	6550	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	MANGANESE	0 58	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	MERCURY	0 1	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	NICKEL	1 3	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	POTASSIUM	612	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	SELENIUM	0 68	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	SILVER	0 28	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	SODIUM	35200	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	THALLIUM	0 3	1	UG/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	VANADIUM	1 4	1	UG/L		S E PERIMETER
76992	GW05549TE	5/21/97	ZINC	3 4	1	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	ALUMINUM	39 6	24 4	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	ANTIMONY	1 3	1 3	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	ARSENIC	2 1	2 1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	BARIUM	69 6	0 4	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	BERYLLIUM	0 3	0 3	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CADMUM	0 3	0 3	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CALCIUM	53500	7 6	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	CHROMIUM	1 2	0 6	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	COBALT	0 8	0 8	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	COPPER	1 3	1 3	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	IRON	11 3	11 3	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	LEAD	1 3	1 3	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	LITHIUM	12	2 5	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	MAGNESIUM	8420	9	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	MANGANESE	0 96	0 4	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	MERCURY	0 1	0 1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	MOLYBDENUM	19	0 6	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	NICKEL	1 1	0 6	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	POTASSIUM	775	23 8	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	SELENIUM	2 8	2	UG/L		S E PERIMETER

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Appendix B Groundwater Analytical Data**Dissolved Metals**

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
76992	GW05731TE	11/19/97	SILVER	0 7	0 7	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	SODIUM	51800	189	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	STRONTIUM	335	0 4	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	THALLIUM	1 9	1 9	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	TIN	2 4	2 4	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	VANADIUM	1 3	0 8	UG/L		S E PERIMETER
76992	GW05731TE	11/19/97	ZINC	8 7	0 9	UG/L		S E PERIMETER

Appendix B Groundwater Analytical Data
Radionuclides

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
4087	GW05542TE	9/9/97	TRITIUM	0	220	PCI/L	U	DOWNGRADIENT
52894	GW05541TE	6/16/97	TRITIUM	22	260	PCI/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TRITIUM	40	210	PCI/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	U-234	25.9	0.078	PCI/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	U-235	1.17	0.096	PCI/L		DOWNGRADIENT
52894	GW05727TE	11/18/97	U-238	18.7	0.138	PCI/L		DOWNGRADIENT
5887	GW05469TE	1/31/97	TRITIUM	42	240	PCI/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	U-234	0.06913	0.244	PCI/L	J	UPGRADIENT
5887	GW05469TE	1/31/97	U-235	-0.0138	0.231	PCI/L	J	UPGRADIENT
5887	GW05469TE	1/31/97	U-238	0.02938	0.231	PCI/L	J	UPGRADIENT
5887	GW05571TE	7/29/97	TRITIUM	82	260	PCI/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	U-234	0.108	0.033	pCi/L		UPGRADIENT
5887	GW05571TE	7/29/97	U-235	0.03	0.089	pCi/L		UPGRADIENT
5887	GW05571TE	7/29/97	U-238	0.132	0.032	pCi/L		UPGRADIENT
6687	GW05550TE	6/25/97	TRITIUM	-3.1	270	PCI/L	U	S PERIMETER
6687	GW05550TE	6/25/97	U-234	0.113	0.028	PCI/L	J	S PERIMETER
6687	GW05550TE	6/25/97	U-235	0.051	0.034	PCI/L	J	S PERIMETER
6687	GW05550TE	6/25/97	U-238	0.061	0.061	PCI/L	J	S PERIMETER
70193	GW05548TE	9/17/97	TRITIUM	-43	220	PCI/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	U-234	0.156	0.067	PCI/L	J	UPGRADIENT
70193	GW05548TE	9/17/97	U-235	0.011	0.031	PCI/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	U-238	0.292	0.055	PCI/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	TRITIUM	150	240	PCI/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	U-234	-0.0162	0.336	PCI/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	U-235	0.06196	0.271	PCI/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	U-238	0.06734	0.182	PCI/L	J	UPGRADIENT
70393	GW05547TE	7/31/97	TRITIUM	600	260	PCI/L		UPGRADIENT
70393	GW05547TE	7/31/97	U-234	0.016	0.043	pCi/L		UPGRADIENT
70393	GW05547TE	7/31/97	U-235	0	0.053	pCi/L		UPGRADIENT
70393	GW05547TE	7/31/97	U-238	0.302	0.043	pCi/L		UPGRADIENT
70493	GW05546TE	9/11/97	TRITIUM	-97	220	PCI/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	U-234	1.03	0.024	PCI/L	B	UPGRADIENT
70493	GW05546TE	9/11/97	U-235	0.032	0.029	PCI/L	J	UPGRADIENT
70493	GW05546TE	9/11/97	U-238	0.673	0.024	PCI/L	J	UPGRADIENT
76992	GW05549TE	5/21/97	TRITIUM	48	190	PCI/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	U-234	3.05	0.029	PCI/L		S E PERIMETER
76992	GW05549TE	5/21/97	U-235	0.133	0.08	PCI/L	J	S E PERIMETER
76992	GW05549TE	5/21/97	U-238	1.54	0.029	PCI/L		S E PERIMETER
76992	GW05731TE	11/19/97	TRITIUM	100	220	PCI/L		S E PERIMETER
B206989	GW05449TE	1/29/97	TRITIUM	37	240	PCI/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TRITIUM	130	240	PCI/L	U	DOWNGRADIENT

Appendix B- Groundwater Analytical Data
Volatile Organic Compounds

Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
4087	GW05542TE	9/9/97	1,1,1,2-TETRACHLOROETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,1,1-TRICHLOROETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,1,2,2-TETRACHLOROETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,1,2-TRICHLOROETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,1-DICHLOROETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,1-DICHLOROETHENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,1-DICHLOROPROPENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2,3-TRICHLOROBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2,3-TRICHLOROPROPANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2,4-TRICHLOROBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2,4-TRIMETHYLBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2-DIBROMO-3-CHLOROPROPANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2-DIBROMOETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2-DICHLOROBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2-DICHLOROBENZENE-D4	86		%REC		DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2-DICHLOROETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,2-DICHLOROPROPANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,3,5-TRIMETHYLBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,3-DICHLOROBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,3-DICHLOROPROPANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	1,4-DICHLOROBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	2,2-DICHLOROPROPANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	2-CHLOROTOLUENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	4-BROMOFLUOROBENZENE	90		%REC		DOWNGRADIENT
4087	GW05542TE	9/9/97	4-CHLOROTOLUENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	BENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	BROMOBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	BROMOCHLOROMETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	BROMODICHLOROMETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	BROMOFORM	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	BROMOMETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	CARBON TETRACHLORIDE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	CHLOROBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	CHLOROETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	CHLOROFORM	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	CHLOROMETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	CIS-1,2-DICHLOROETHENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	CIS-1,3-DICHLOROPROPENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	DIBROMOCHLOROMETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	DIBROMOMETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	DICHLORODIFLUOROMETHANE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	ETHYLBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	HEXACHLOROBUTADIENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	ISOPROPYLBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	METHYLENE CHLORIDE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	N-BUTYLBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	N-PROPYLBENZENE	0.5	0.5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	NAPHTHALENE	0.5	0.5	UG/L	U	DOWNGRADIENT

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Appendix B Groundwater Analytical Data
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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
4087	GW05542TE	9/9/97	P-ISOPROPYLtoluene	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	SEC-BUTYLBENZENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	STYRENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	TERT-BUTYLBENZENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	TETRACHLOROETHENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	TOLUENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	TRANS-1,2-DICHLOROETHENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	TRANS-1,3-DICHLOROPROPENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	TRICHLOROETHENE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	TRICHLOROFLUOROMETHANE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	VINYL CHLORIDE	0 5	0 5	UG/L	U	DOWNGRADIENT
4087	GW05542TE	9/9/97	XYLENES, TOTAL	0 5	0 5	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,1,2-TETRACHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,1,1-TRICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,1,2,2-TETRACHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,1-DICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,1-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2,4-TRIMETHYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2-DIBROMO-3-CHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2-DIBROMOETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2-DICHLOROBENZENE-D4	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2-DICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,3,5-TRIMETHYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	2,2-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	2-CHLOROTOLUENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	4-BROMOFLUOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	4-CHLOROTOLUENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	BENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	BROMOBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	BROMOCHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	BROMODICHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	BROMOFORM	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	BROMOMETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CARBON TETRACHLORIDE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CHLOROFORM	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT

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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
52894	GW05727TE	11/18/97	CIS-1,2-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	DIBROMOMETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	ETHYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	ISOPROPYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	METHYLENE CHLORIDE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	N-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	N-PROPYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	NAPHTHALENE	3	1	UG/L	B	DOWNGRADIENT
52894	GW05727TE	11/18/97	P-ISOPROPYL TOLUENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	SEC-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	STYRENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TERT-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TETRACHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TOLUENE	0.2	1	UG/L	JB	DOWNGRADIENT
52894	GW05727TE	11/18/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TRICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	TRICHLOROFLUOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	VINYL CHLORIDE	1	1	UG/L	U	DOWNGRADIENT
52894	GW05727TE	11/18/97	XYLENES, TOTAL	1	1	UG/L	U	DOWNGRADIENT
5887	GW05469TE	1/31/97	1,1,1,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,1,1-TRICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,1,2,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,1-DICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,1-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,2-DIBROMOETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,2-DICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BENZENE, 1,2,4-TRIMETHYL-	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BENZENE, 1,3,5-TRIMETHYL-	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BROMOBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BROMODICHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	BROMOFORM	1	1	UG/L	U	UPGRADIENT

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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
5887	GW05469TE	1/31/97	BROMOMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CARBON TETRACHLORIDE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CHLOROFORM	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CIS-1,2-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	CUMENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	DIBROMOMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	ETHYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	METHYLENE CHLORIDE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	N-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	N-PROPYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	NAPHTHALENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	O-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	P-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	P-CYMENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	PROPANE, 1,2-DIBROMO-3-CHLOR	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	SEC-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	SEC-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	STYRENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	SUR-1,2-DICHLOROETHANE-D4	108		%REC		UPGRADIENT
5887	GW05469TE	1/31/97	SUR-4-BROMOFLUOROBENZENE	95		%REC		UPGRADIENT
5887	GW05469TE	1/31/97	SUR-TOLUENE-D8	100		%REC		UPGRADIENT
5887	GW05469TE	1/31/97	TERT-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	TETRACHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	TOLUENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	TOTAL XYLEMES	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	TRICHLOROETHENE	0.5	1	UG/L	J	UPGRADIENT
5887	GW05469TE	1/31/97	TRICHLOROFUOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05469TE	1/31/97	VINYL CHLORIDE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,1,1,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,1,1-TRICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,1,2,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,1-DICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,1-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,2-DIBROMOETHANE	1	1	UG/L	U	UPGRADIENT

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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
5887	GW05571TE	7/29/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,2-DICHLOROBENZENE-D4	102		%REC		UPGRADIENT
5887	GW05571TE	7/29/97	1,2-DICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	2,2-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	4-ISOPROPYL TOLUENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BENZENE, 1,2,4-TRIMETHYL-	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BROMOBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BROMODICHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BROMOFLUOROBENZENE	94		%REC		UPGRADIENT
5887	GW05571TE	7/29/97	BROMOFORM	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	BROMOMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CARBON TETRACHLORIDE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CHLOROETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CHLOROFORM	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CIS-1,2-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	DIBROMOMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	ETHYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	ISOPROPYL BENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	METHYLENE CHLORIDE	12	1	UG/L		UPGRADIENT
5887	GW05571TE	7/29/97	N-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	N-PROPYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	NAPHTHALENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	O-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	P-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	PROPANE, 1,2-DIBROMO-3-CHLOR	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	SEC-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	STYRENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	TERT-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	TETRACHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	TOLUENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	TOTAL XYLEMES	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
5887	GW05571TE	7/29/97	TRICHLOROETHENE	0.52	1	UG/L	J	UPGRADIENT
5887	GW05571TE	7/29/97	TRICHLOROFLUOROMETHANE	1	1	UG/L	U	UPGRADIENT

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5887	GW05571TE	7/29/97	VINYL CHLORIDE	1	1	UG/L	U	UPGRADIENT
6687	GW05550TE	6/25/97	1 1 1 2-TETRACHLOROETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1 1,1-TRICHLOROETHANE	12	1	UG/L		S PERIMETER
6687	GW05550TE	6/25/97	1 1 2 2-TETRACHLOROETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1 1 2-TRICHLOROETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1 1-DICHLOROETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1 1-DICHLOROETHENE	4	1	UG/L		S PERIMETER
6687	GW05550TE	6/25/97	1 1-DICHLOROPROPENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1 2,3-TRICHLOROBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1 2 4-TRICHLOROBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,2,4-TRIMETHYLBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,2-DIBROMO-3-CHLOROPROPANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,2-DIBROMOETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,2-DICHLOROBENZENE-D4	94		%REC J		S PERIMETER
6687	GW05550TE	6/25/97	1,2-DICHLOROETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1 3,5-TRIMETHYLBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	2,2-DICHLOROPROPANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	2-CHLOROTOLUENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	4-BROMOFLUOROBENZENE	99		%REC J		S PERIMETER
6687	GW05550TE	6/25/97	4-CHLOROTOLUENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	BENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	BROMOBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	BROMOCHLOROMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	BROMODICHLOROMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	BROMOFORM	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	BROMOMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	CARBON TETRACHLORIDE	1	1	UG/L	J	S PERIMETER
6687	GW05550TE	6/25/97	CHLOROBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	CHLOROETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	CHLOROFORM	0	1	UG/L	J,B	S PERIMETER
6687	GW05550TE	6/25/97	CHLOROMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	CIS-1,2-DICHLOROETHENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	DIBROMOMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	ETHYLBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	ISOPROPYLBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	M+P-XYLENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	METHYLENE CHLORIDE	1	1	UG/L	J,B	S PERIMETER
6687	GW05550TE	6/25/97	N-BUTYLBENZENE	1	1	UG/L	U	S PERIMETER

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6687	GW05550TE	6/25/97	N-PROPYLBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	NAPHTHALENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	O-XYLENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	P-ISOPROPYLtoluene	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	SEC-BUTYLBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	STYRENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	TERT-BUTYLBENZENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	TETRACHLOROETHENE	1	1	UG/L	J	S PERIMETER
6687	GW05550TE	6/25/97	TOLUENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	TRICHLOROETHENE	4	1	UG/L		S PERIMETER
6687	GW05550TE	6/25/97	TRICHLOROFLUOROMETHANE	1	1	UG/L	U	S PERIMETER
6687	GW05550TE	6/25/97	VINYL CHLORIDE	1	1	UG/L	U	S PERIMETER
70193	GW05548TE	9/17/97	1,1,1,2-TETRACHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,1,1-TRICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,1,2,2-TETRACHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,1,2-TRICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,1-DICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,1-DICHLOROETHENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,1-DICHLOROPROPENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2,3-TRICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2,3-TRICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2,4-TRICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2,4-TRIMETHYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2-DIBROMO-3-CHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2-DIBROMOETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2-DICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2-DICHLOROBENZENE-D4	81		%REC		UPGRADIENT
70193	GW05548TE	9/17/97	1,2-DICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,2-DICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,3,5-TRIMETHYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,3-DICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,3-DICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	1,4-DICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	2,2-DICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	2-CHLOROTOLUENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	4-BROMOFLUOROBENZENE	89		%REC		UPGRADIENT
70193	GW05548TE	9/17/97	4-CHLOROTOLUENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	BENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	BROMOBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	BROMOCHLOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	BROMODICHLOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	BROMOFORM	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	BROMOMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CARBON TETRACHLORIDE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT

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70193	GW05548TE	9/17/97	CHLOROFORM	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CHLOROMETHANE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CIS-1 2-DICHLOROETHENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	CIS-1 3-DICHLOROPROPENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	DIBROMOCHLOROMETHANE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	DIBROMOMETHANE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	DICHLORODIFLUOROMETHANE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	ETHYLBENZENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	HEXACHLOROBUTADIENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	ISOPROPYLBENZENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	METHYLENE CHLORIDE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	N-BUTYLBENZENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	N-PROPYLBENZENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	NAPHTHALENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	P-ISOPROPYLtoluene	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	SEC-BUTYLBENZENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	STYRENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TERT-BUTYLBENZENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TETRACHLOROETHENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TOLUENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TRANS-1,2-DICHLOROETHENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TRANS-1,3-DICHLOROPROPENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TRICHLOROETHENE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	TRICHLOROFLUOROMETHANE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	VINYL CHLORIDE	0 5	0 5	UG/L	U	UPGRADIENT
70193	GW05548TE	9/17/97	XYLENES, TOTAL	0 5	0 5	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,1,1,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,1,1-TRICHLOROETHANE	37	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,1,2,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,1-DICHLOROETHANE	0 8	1	UG/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	1,1-DICHLOROETHENE	15	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,2-DIBROMOETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,2-DICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BENZENE, 1,2,4-TRIMETHYL-	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BENZENE, 1,3,5-TRIMETHYL-	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BROMOBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT

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70393	GW05452TE	1/23/97	BROMODICHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BROMOFORM	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	BROMOMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CARBON TETRACHLORIDE	0.9	1	UG/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	CHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CHLOROFORM	0.3	1	UG/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	CHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CIS-1,2-DICHLOROETHENE	0.4	1	UG/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	CUMENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	DIBROMOMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	ETHYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	HEXACHLOROBUTADIENE	0.3	1	UG/L	J	UPGRADIENT
70393	GW05452TE	1/23/97	METHYLENE CHLORIDE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	N-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	N-PROPYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	NAPHTHALENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	O-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	P-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	P-CYMENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	PROPANE, 1,2-DIBROMO-3-CHLOR	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	SEC-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	SEC-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	STYRENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	SUR-1,2-DICHLOROETHANE-D4	106		%REC		UPGRADIENT
70393	GW05452TE	1/23/97	SUR-4-BROMOFLUOROBENZENE	96		%REC		UPGRADIENT
70393	GW05452TE	1/23/97	SUR-TOLUENE-D8	100		%REC		UPGRADIENT
70393	GW05452TE	1/23/97	TERT-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	TETRACHLOROETHENE	7	1	UG/L		UPGRADIENT
70393	GW05452TE	1/23/97	TOLUENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	TOTAL XYLEMES	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	TRICHLOROETHENE	25	1	UG/L		UPGRADIENT
70393	GW05452TE	1/23/97	TRICHLOROFLUOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	VINYL CHLORIDE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,1,1,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,1,1-TRICHLOROETHANE	53	2	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	1,1,2,2-TETRACHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,1-DICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,1-DICHLOROETHENE	22	1	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT

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70393	GW05547TE	7/31/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,2-DIBROMOETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,2-DICHLOROBENZENE-D4	103		%REC		UPGRADIENT
70393	GW05547TE	7/31/97	1,2-DICHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	2,2-DICHLOROPROPANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	4-ISOPROPYLtoluene	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BENZENE, 1,2,4-TRIMETHYL	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BENZENE, 1,3,5-TRIMETHYL-	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BROMOBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BROMODICHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BROMOFLUOROBENZENE	96		%REC		UPGRADIENT
70393	GW05547TE	7/31/97	BROMOFORM	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	BROMOMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	CARBON TETRACHLORIDE	12	1	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	CHLOROBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	CHLOROETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	CHLOROFORM	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	CHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	CIS-1,2-DICHLOROETHENE	0.5	1	UG/L	J	UPGRADIENT
70393	GW05547TE	7/31/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	DIBROMOMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	ETHYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	ISOPROPYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	METHYLENE CHLORIDE	1.5	1	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	N-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	N-PROPYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	NAPHTHALENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	O-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	P-CHLOROTOLUENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	PROPANE, 1,2-DIBROMO-3-CHLOR	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	SEC-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	STYRENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	TERT-BUTYLBENZENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	TETRACHLOROETHENE	8.5	1	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	TOLUENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	TOTAL XYLEMES	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	UPGRADIENT

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70393	GW05547TE	7/31/97	TRICHLOROETHENE	26	1	UG/L		UPGRADIENT
70393	GW05547TE	7/31/97	TRICHLOROFLUOROMETHANE	1	1	UG/L	U	UPGRADIENT
70393	GW05547TE	7/31/97	VINYL CHLORIDE	1	1	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,1,1-TRIACHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,1,1-TRICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,1,2-TRIACHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,1,2-TRICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,1-DICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,1-DICHLOROETHENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,1-DICHLOROPROPENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2,3-TRICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2,3-TRICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2,4-TRICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2,4-TRIMETHYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2-DIBROMO-3-CHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2-DIBROMOETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2-DICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2-DICHLOROBENZENE-D4	75		%REC		UPGRADIENT
70493	GW05546TE	9/11/97	1,2-DICHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,2-DICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,3,5-TRIMETHYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,3-DICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,3-DICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	1,4-DICHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	2,2-DICHLOROPROPANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	2-CHLOROTOLUENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	4-BROMOFLUOROBENZENE	82		%REC		UPGRADIENT
70493	GW05546TE	9/11/97	4-CHLOROTOLUENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	BENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	BROMOBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	BROMOCHLOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	BROMODICHLOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	BROMOFORM	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	BROMOMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CARBON TETRACHLORIDE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CHLOROBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CHLOROETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CHLOROFORM	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CHLOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CIS-1,2-DICHLOROETHENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	CIS-1,3-DICHLOROPROPENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	DIBROMOCHLOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	DIBROMOMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	DICHLORODIFLUOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	ETHYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	HEXACHLOROBUTADIENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	ISOPROPYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	METHYLENE CHLORIDE	0.5	0.5	UG/L	U	UPGRADIENT

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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
70493	GW05546TE	9/11/97	N-BUTYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	N-PROPYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	NAPHTHALENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	P-ISOPROPYLtoluene	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	SEC-BUTYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	STYRENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TERT-BUTYLBENZENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TETRACHLOROETHENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TOLUENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TRANS-1 2-DICHLOROETHENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TRANS-1 3-DICHLOROPROPENE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TRICHLOROETHENE	0.8	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	TRICHLOROFUOROMETHANE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	VINYL CHLORIDE	0.5	0.5	UG/L	U	UPGRADIENT
70493	GW05546TE	9/11/97	XYLENES, TOTAL	0.5	0.5	UG/L	U	UPGRADIENT
76992	GW05549TE	5/21/97	1,1,1,2-TETRACHLOROETHANE	1	0.3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,1,1-TRICHLOROETHANE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,1,2,2-TETRACHLOROETHANE	1	0.4	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,1,2-TRICHLOROETHANE	1	0.4	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,1-DICHLOROETHANE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,1-DICHLOROETHENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,1-DICHLOROPROPENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,2,3-TRICHLOROBENZENE	1	0.6	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,2,3-TRICHLOROPROPANE	1	0.8	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,2,4-TRICHLOROBENZENE	1	0.3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,2,4-TRIMETHYLBENZENE	1	0.1	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,2-DICHLOROBENZENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,2-DICHLOROETHANE	1	0.3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,2-DICHLOROETHANE-D4	89	%REC			S E PERIMETER
76992	GW05549TE	5/21/97	1,2-DICHLOROPROPANE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,3,5-TRIMETHYLBENZENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,3-DICHLOROBENZENE	1	0.1	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,3-DICHLOROPROPANE	1	0.5	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1,4-DICHLOROBENZENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	1-METHYLETHYLBENZENE (CUMEN)	1	0.1	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	2,2-DICHLOROPROPANE	1	0.3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	2-CHLOROTOLUENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	4-BROMOFLUOROBENZENE	100	%REC			S E PERIMETER
76992	GW05549TE	5/21/97	4-CHLOROTOLUENE	1	0.3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	BENZENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	BROMOBENZENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	BROMOCHLOROMETHANE	1	0.3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	BROMODICHLOROMETHANE	1	0.3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	BROMOFORM	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	BROMOMETHANE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	CARBON TETRACHLORIDE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	CHLOROBENZENE	1	0.2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	CHLOROETHANE	1	0.5	ug/L	U	S E PERIMETER

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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
76992	GW05549TE	5/21/97	CHLOROFORM	1	0 1	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	CHLOROMETHANE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	CIS-1,2-DICHLOROETHENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	CIS-1,3-DICHLOROPROPENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	DBCP (1,2-DIBROMO-3-CHLOROPR)	1	0 7	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	DIBROMOCHLOROMETHANE	1	0 3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	DIBROMOMETHANE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	DICHLORODIFLUOROMETHANE	1	0 3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	EDB (1,2-DIBROMOETHANE)	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	ETHYLBENZENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	HEXA-CHLOROBUTADIENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	METHYLENE CHLORIDE	1	0 3	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	N-BUTYLBENZENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	N-PROPYLBENZENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	NAPHTHALENE	1	0 5	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	P-ISOPROPYL TOLUENE (P-CYREN)	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	SEC-BUTYLBENZENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	STYRENE	1	0 1	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	TERT-BUTYLBENZENE	1	0 1	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	TETRA-CHLOROETHENE	1	0 1	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	TOLUENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	TOLUENE-D8	102	%REC			S E PERIMETER
76992	GW05549TE	5/21/97	TRANS-1,2-DICHLOROETHENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	TRANS-1,3-DICHLOROPROPENE	1	0 4	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	TRICHLOROETHENE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	TRICHLOROFUOROMETHANE	1	0 4	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	VINYL CHLORIDE	1	0 2	ug/L	U	S E PERIMETER
76992	GW05549TE	5/21/97	XYLENES (TOTAL)	1	0 6	ug/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,1,1,2-TETRA-CHLOROETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,1,1-TRICHLOROETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,1,2,2-TETRA-CHLOROETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,1-DICHLOROETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,1-DICHLOROETHENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2,4-TRIMETHYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2-DIBROMO-3-CHLOROPROPANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2-DIBROMOETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2-DICHLOROBENZENE-D4	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2-DICHLOROETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,3,5-TRIMETHYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	S E PERIMETER

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Appendix B Groundwater Analytical Data
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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
76992	GW05731TE	11/19/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	2,2-DICHLOROPROPANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	2-CHLOROTOLUENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	4-BROMOFLUOROBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	4-CHLOROTOLUENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	BENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	BROMOBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	BROMOCHLOROMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	BROMODICHLOROMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	BROMOFORM	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	BROMOMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CARBON TETRACHLORIDE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CHLOROBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CHLOROETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CHLOROFORM	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CHLOROMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CIS-1,2-DICHLOROETHENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	DIBROMOMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	ETHYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	ISOPROPYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	METHYLENE CHLORIDE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	N-BUTYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	N-PROPYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	NAPHTHALENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	P-ISOPROPYLtoluene	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	SEC-BUTYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	STYRENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	TERT-BUTYLBENZENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	TETRACHLOROETHENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	TOLUENE	0.6	1	UG/L	JB	S E PERIMETER
76992	GW05731TE	11/19/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	TRICHLOROETHENE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	TRICHLOROFUOROMETHANE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	VINYL CHLORIDE	1	1	UG/L	U	S E PERIMETER
76992	GW05731TE	11/19/97	XYLENES, TOTAL	1	1	UG/L	U	S E PERIMETER
B206989	GW05449TE	1/29/97	1,1,1,2-TETRACHLOROETHANE	1	1	UG/L	U	DNNGRADIENT
B206989	GW05449TE	1/29/97	1,1,1-TRICHLOROETHANE	1	1	UG/L	U	DNNGRADIENT
B206989	GW05449TE	1/29/97	1,1,2,2-TETRACHLOROETHANE	1	1	UG/L	U	DNNGRADIENT
B206989	GW05449TE	1/29/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	DNNGRADIENT
B206989	GW05449TE	1/29/97	1,1-DICHLOROETHANE	1	1	UG/L	U	DNNGRADIENT
B206989	GW05449TE	1/29/97	1,1-DICHLOROETHENE	1	1	UG/L	U	DNNGRADIENT
B206989	GW05449TE	1/29/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	DNNGRADIENT
B206989	GW05449TE	1/29/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	DNNGRADIENT

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Appendix B Groundwater Analytical Data
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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
B206989	GW05449TE	1/29/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,2-DIBROMOETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,2-DICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BENZENE, 1,2,4-TRIMETHYL-	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BENZENE, 1,3,5-TRIMETHYL-	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BROMOBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BROMOCHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BROMODICHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BROMOFORM	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	BROMOMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CARBON TETRACHLORIDE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CHLOROFORM	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CIS-1,2-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	CUMENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	DIBROMOMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	ETHYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	METHYLENE CHLORIDE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	N-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	N-PROPYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	NAPHTHALENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	O-CHLOROTOLUENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	P-CHLOROTOLUENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	P-CYMENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	PROPANE, 1,2-DIBROMO-3-CHLOR	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	SEC-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	SEC-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	STYRENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	SUR-1,2-DICHLOROETHANE-D4	107		%REC		DOWNGRADIENT
B206989	GW05449TE	1/29/97	SUR-4-BROMOFLUOROBENZENE	92		%REC		DOWNGRADIENT
B206989	GW05449TE	1/29/97	SUR-TOLUENE-D8	102		%REC		DOWNGRADIENT
B206989	GW05449TE	1/29/97	TERT-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	TETRACHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	TOLUENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	TOTAL XYLEMES	1	1	UG/L	U	DOWNGRADIENT

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Appendix B Groundwater Analytical Data
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Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
B206989	GW05449TE	1/29/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	TRICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	TRICHLOROFLUOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	VINYL CHLORIDE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,1,1,2-TETRACHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,1,1-TRICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,1,2,2-TETRACHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,1,2-TRICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,1-DICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,1-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,1-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2,3-TRICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2,3-TRICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2,4-TRICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2,4-TRIMETHYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2-DIBROMO-3-CHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2-DIBROMOETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2-DICHLOROBENZENE-D4		%REC			DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2-DICHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,2-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,3,5-TRIMETHYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,3-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,3-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	1,4-DICHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	2,2-DICHLOROPROPANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	2-CHLOROTOLUENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	4-BROMOFLUOROBENZENE		%REC			DOWNGRADIENT
B206989	GW05538TE	9/24/97	4-CHLOROTOLUENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	BENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	BROMOBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	BROMOCHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	BROMODICHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	BROMOFORM	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	BROMOMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	CARBON TETRACHLORIDE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	CHLOROBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	CHLOROETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	CHLOROFORM	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	CHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	CIS-1,2-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	CIS-1,3-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	DIBROMOCHLOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	DIBROMOMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	DICHLORODIFLUOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	ETHYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	HEXACHLOROBUTADIENE	1	1	UG/L	U	DOWNGRADIENT

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Appendix B Groundwater Analytical Data**Volatile Organic Compounds**

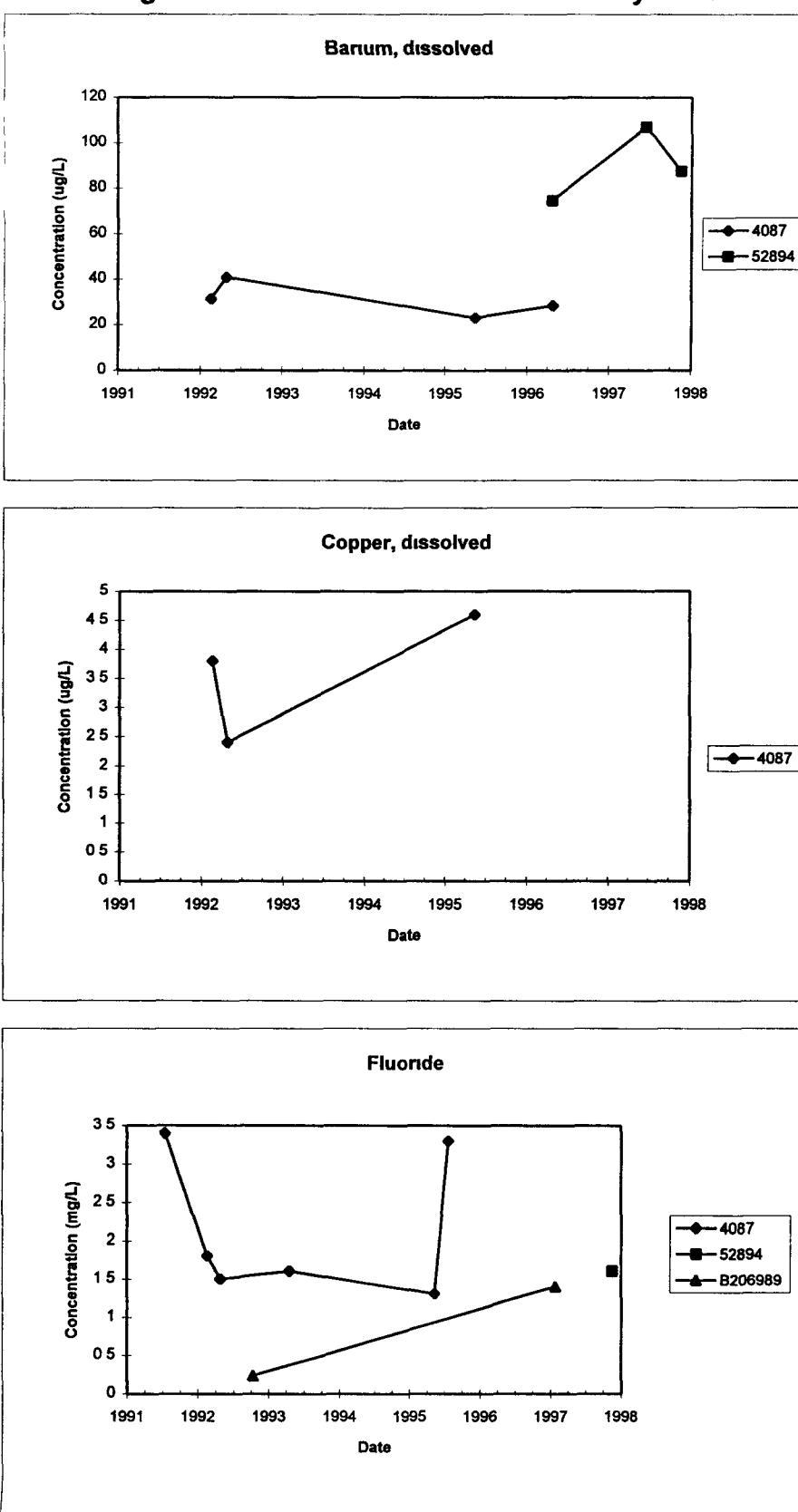
Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
B206989	GW05538TE	9/24/97	ISOPROPYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	METHYLENE CHLORIDE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	N-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	N-PROPYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	NAPHTHALENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	P-ISOPROPYLtoluene	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	SEC-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	STYRENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TERT-BUTYLBENZENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TETRACHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TOLUENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TRANS-1,2-DICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TRANS-1,3-DICHLOROPROPENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TRICHLOROETHENE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	TRICHLOROFLUOROMETHANE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	VINYL CHLORIDE	1	1	UG/L	U	DOWNGRADIENT
B206989	GW05538TE	9/24/97	XYLENES TOTAL	1	1	UG/L	U	DOWNGRADIENT

Appendix B Groundwater Analytical Data
Water Quality Parameters

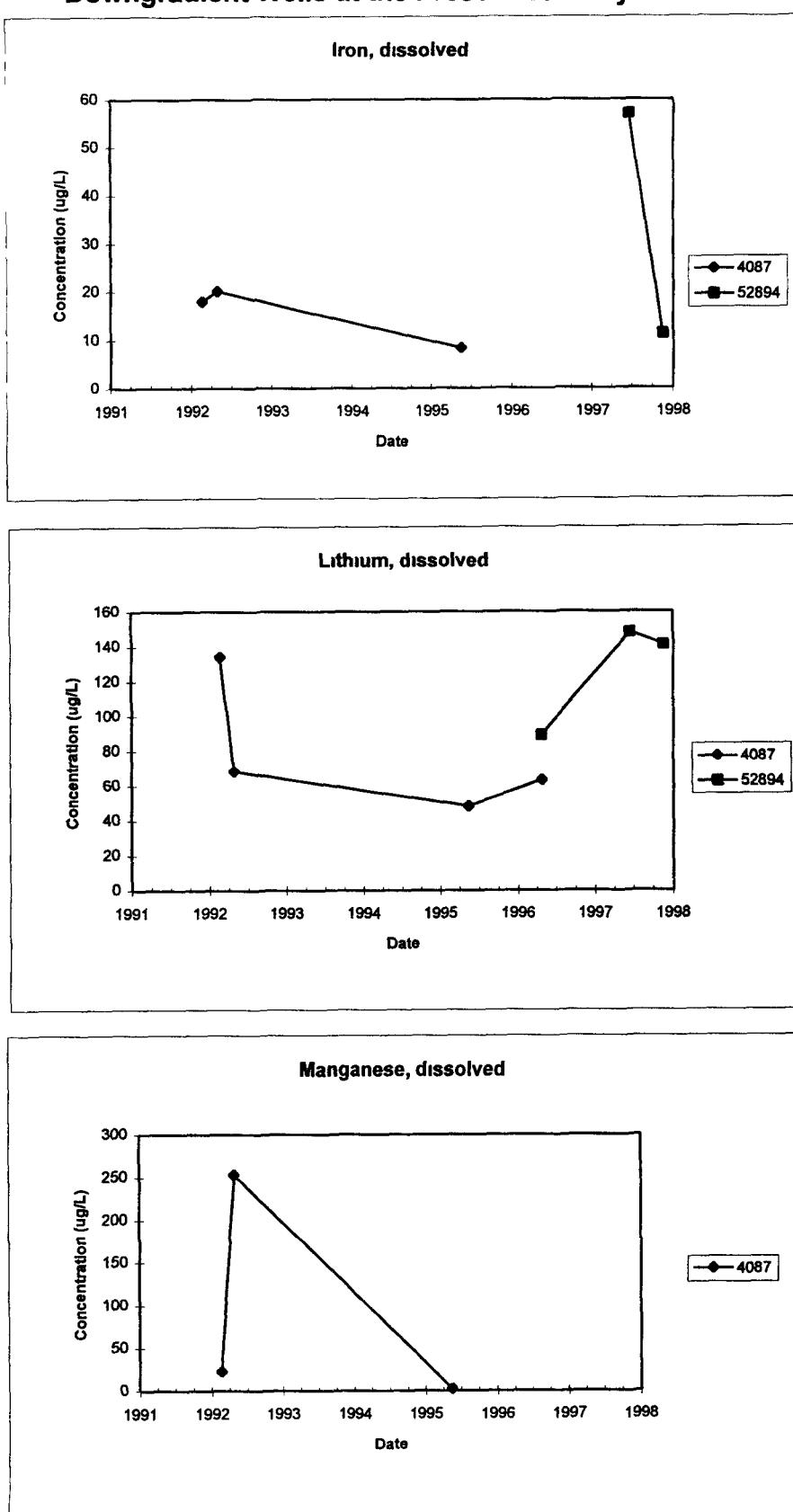
Location	Sample number	Date	Analyte	Result	Det Lim	Units	Qual	Location Type
4087	GW05542TE	9/9/97	NITRATE/NITRITE AS N	0 89	0 05	MG/L		DOWNGRADIENT
52894	GW05541TE	6/16/97	NITRATE/NITRITE AS N	0 01	0 05	MG/L	U	DOWNGRADIENT
52894	GW05727TE	11/19/97	FLUORIDE	1 6		MG/L		DOWNGRADIENT
52894	GW05727TE	11/19/97	NITRATE/NITRITE AS N	0 41		MG/L		DOWNGRADIENT
52894	GW05727TE	11/19/97	SULFATE AS SO4	200		MG/L		DOWNGRADIENT
52894	GW05727TE	11/19/97	TOTAL DISSOLVED SOLIDS	740		MG/L		DOWNGRADIENT
5887	GW05469TE	1/31/97	FLUORIDE	0 13	0 5	MG/L	B	UPGRADIENT
5887	GW05469TE	1/31/97	NITRATE/NITRITE AS N	3 6	0 1	MG/L		UPGRADIENT
5887	GW05469TE	1/31/97	SULFATE AS SO4	31 1	5	MG/L		UPGRADIENT
5887	GW05469TE	1/31/97	TOTAL DISSOLVED SOLIDS	183	10	MG/L		UPGRADIENT
5887	GW05571TE	7/29/97	FLUORIDE	0 11	0 05	MG/L		UPGRADIENT
5887	GW05571TE	7/29/97	NITRATE/NITRITE AS N	3 3	0 05	MG/L		UPGRADIENT
5887	GW05571TE	7/29/97	SULFATE AS SO4	24	1	MG/L		UPGRADIENT
5887	GW05571TE	7/29/97	TOTAL DISSOLVED SOLIDS	120	10	MG/L		UPGRADIENT
6687	GW05550TE	6/25/97	FLUORIDE	0 5	1	MG/L	B	S PERIMETER
6687	GW05550TE	6/25/97	NITRATE/NITRITE AS N	4 9	0 1	MG/L		S PERIMETER
6687	GW05550TE	6/25/97	SULFATE AS SO4	491	50	MG/L		S PERIMETER
6687	GW05550TE	6/25/97	TOTAL DISSOLVED SOLIDS	793	10	MG/L		S PERIMETER
70193	GW05548TE	9/17/97	FLUORIDE	0 35	0 05	MG/L		UPGRADIENT
70193	GW05548TE	9/17/97	NITRATE/NITRITE AS N	1 9	0 05	MG/L		UPGRADIENT
70193	GW05548TE	9/17/97	SULFATE AS SO4	21	1	MG/L		UPGRADIENT
70193	GW05548TE	9/17/97	TOTAL DISSOLVED SOLIDS	150	10	MG/L		UPGRADIENT
70393	GW05452TE	1/23/97	FLUORIDE	0 07	0 5	MG/L	U	UPGRADIENT
70393	GW05452TE	1/23/97	NITRATE/NITRITE AS N	3 2	0 1	MG/L		UPGRADIENT
70393	GW05452TE	1/23/97	SULFATE AS SO4	24 6	5	MG/L		UPGRADIENT
70393	GW05452TE	1/23/97	TOTAL DISSOLVED SOLIDS	185	10	MG/L		UPGRADIENT
70393	GW05547TE	7/31/97	FLUORIDE	0 1	0 05	MG/L		UPGRADIENT
70393	GW05547TE	7/31/97	NITRATE/NITRITE AS N	4 4	0 05	MG/L		UPGRADIENT
70393	GW05547TE	7/31/97	SULFATE AS SO4	31	1	MG/L		UPGRADIENT
70393	GW05547TE	7/31/97	TOTAL DISSOLVED SOLIDS	160	10	MG/L		UPGRADIENT
70493	GW05546TE	9/11/97	FLUORIDE	0 52	0 05	MG/L		UPGRADIENT
70493	GW05546TE	9/11/97	NITRATE/NITRITE AS N	2	0 05	MG/L		UPGRADIENT
70493	GW05546TE	9/11/97	SULFATE AS SO4	13	1	MG/L		UPGRADIENT
70493	GW05546TE	9/11/97	TOTAL DISSOLVED SOLIDS	160	10	MG/L		UPGRADIENT
76992	GW05549TE	5/21/97	FLUORIDE	0 82	0 5	MG/L		S E PERIMETER
76992	GW05549TE	5/21/97	NITRATE/NITRITE AS N	0 76	0 05	MG/L		S E PERIMETER
76992	GW05549TE	5/21/97	SULFATE AS SO4	56 1	10	MG/L		S E PERIMETER
76992	GW05549TE	5/21/97	TOTAL DISSOLVED SOLIDS	246	10	MG/L		S E PERIMETER
76992	GW05731TE	11/18/97	FLUORIDE	0 8		MG/L		S E PERIMETER
76992	GW05731TE	11/18/97	NITRATE/NITRITE AS N	0 16		MG/L		S E PERIMETER
76992	GW05731TE	11/18/97	SULFATE AS SO4	70		MG/L		S E PERIMETER
76992	GW05731TE	11/18/97	TOTAL DISSOLVED SOLIDS	330		MG/L		S E PERIMETER
B206989	GW05449TE	1/29/97	FLUORIDE	1 4	10	MG/L	U	DOWNGRADIENT
B206989	GW05449TE	1/29/97	SULFATE AS SO4	2760	500	MG/L		DOWNGRADIENT
B206989	GW05449TE	1/29/97	TOTAL DISSOLVED SOLIDS	4960	50	MG/L		DOWNGRADIENT
B206989	GW05538TE	9/24/97	NITRATE/NITRITE AS N	41	0 05	MG/L		DOWNGRADIENT

Appendix C: Trend Plots of Selected Analytes for Downgradient Wells

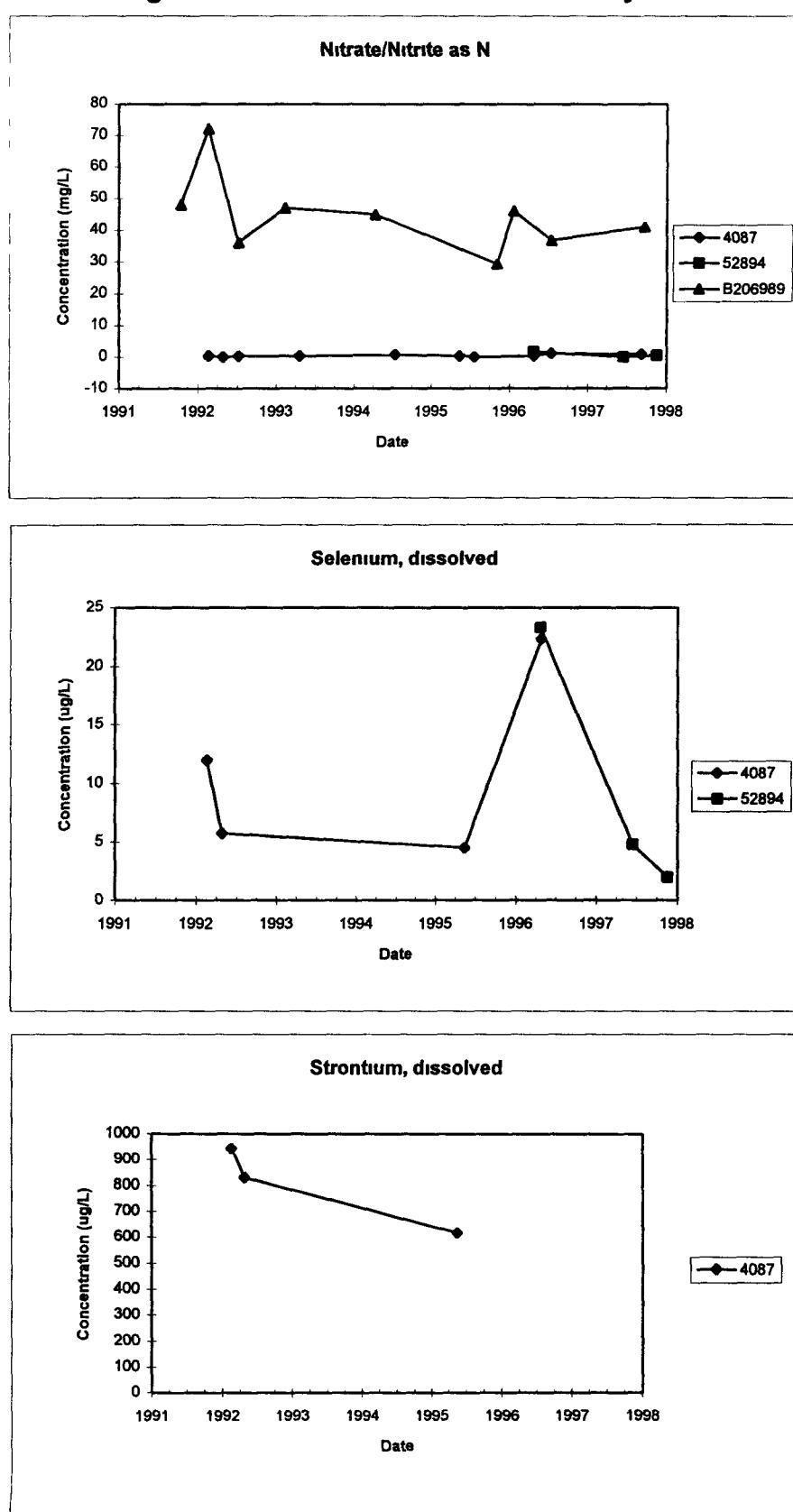
Appendix C
Trend Plots for Selected Analytes-
Downgradient Wells at the Present Sanitary Landfill



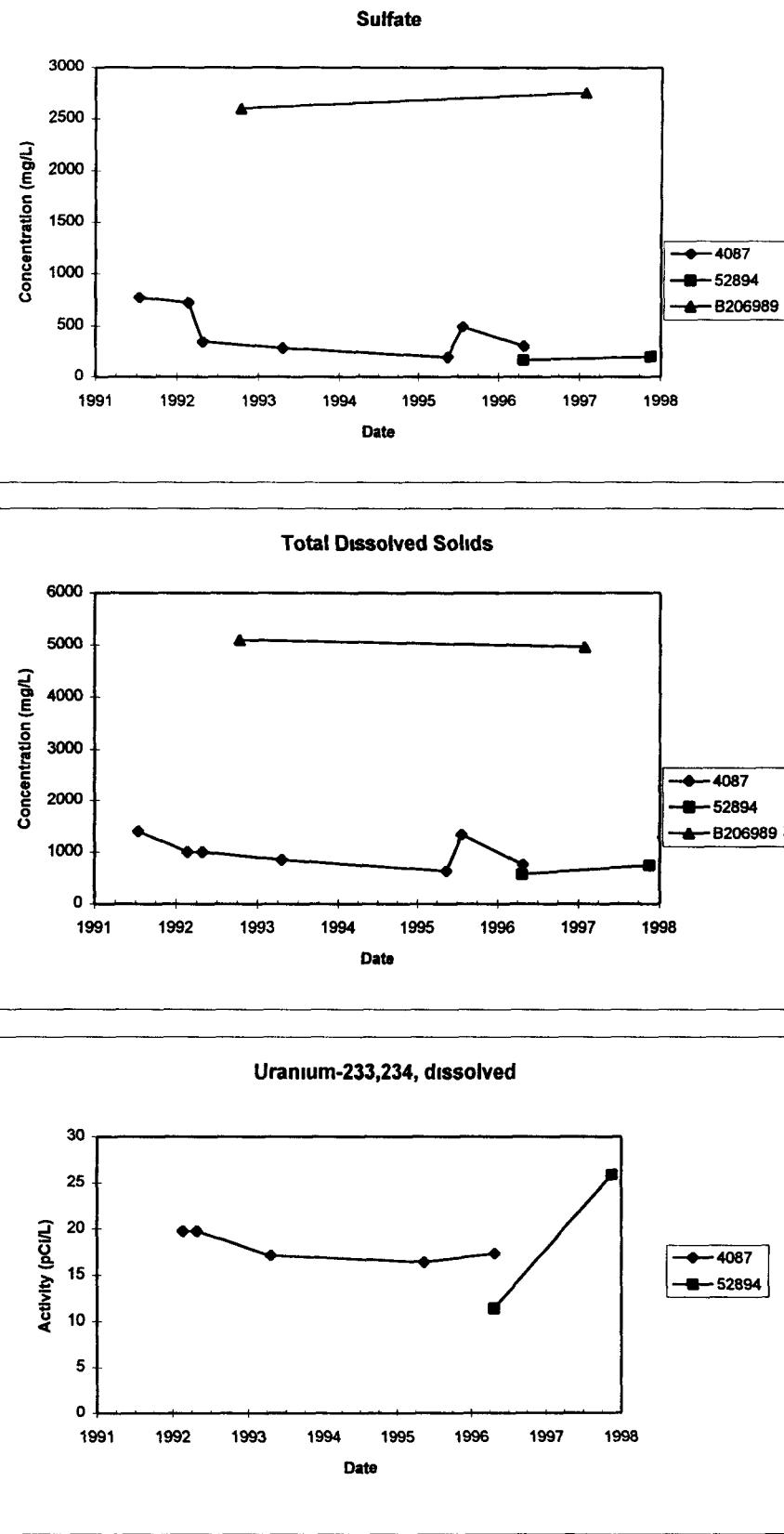
Appendix C
Trend Plots for Selected Analytes-
Downgradient Wells at the Present Sanitary Landfill



Appendix C
Trend Plots for Selected Analytes-
Downgradient Wells at the Present Sanitary Landfill

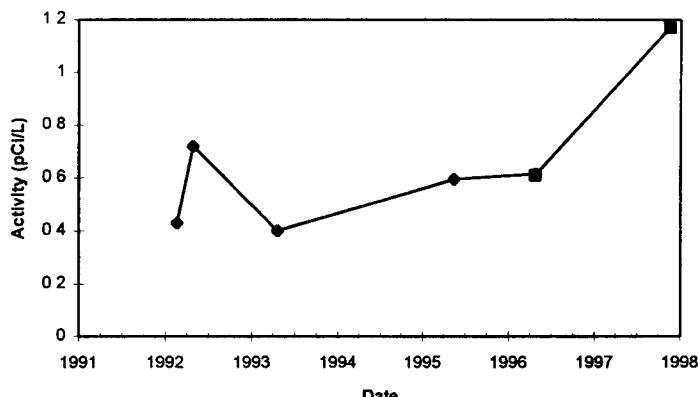


Appendix C
Trend Plots for Selected Analytes-
Downgradient Wells at the Present Sanitary Landfill

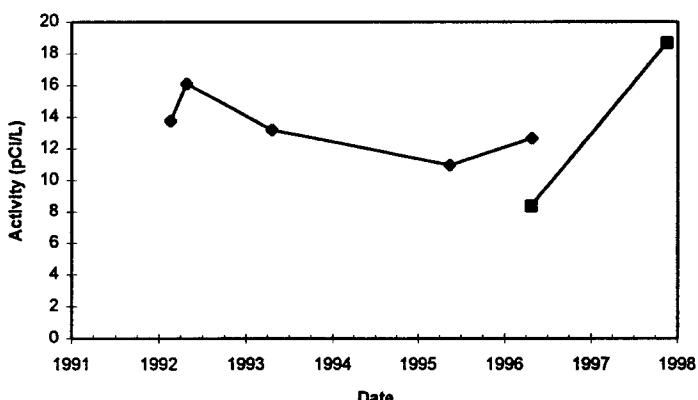


Appendix C
Trend Plots for Selected Analytes-
Downgradient Wells at the Present Sanitary Landfill

Uranium-235, dissolved



Uranium-238, dissolved



Zinc, dissolved

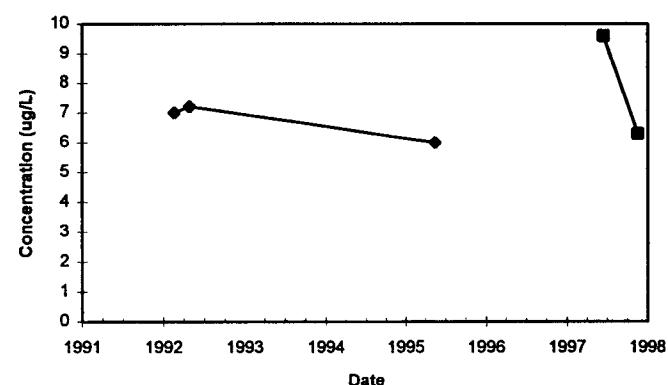


Figure 4-1
Water Quality Parameters (mg/L)
at the Present Sanitary Landfill
1997

EXPLANATION

- Groundwater Monitoring Well
- UHSU Surface Material
- Groundwater Monitoring Well
- UHSU Bedrock
- Landfill Groundwater Monitoring Well

All Other Existing Well



Groundwater Intercept System
Individual Hazardous Substances Site

Standard Map Features

- Building and other structures
- Lakes and ponds
- Stream, ditches, other drainage features
- Fences and other barriers
- Contour (20-Foot)
- Paved road
- Dirt road

NOTE:
BDL Below Detection Limit
LW Located Well
NS No Sample Scheduled
ABD Abandoned

Source of GIS data available upon request.

1 inch Scale 1:2830
Present Approximate by 244 feet

0 200 400 ft

Stat Plan Coo d at Proj Z
Colorado Cmtial
Dat m NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site

RMRS Rocky Mountain
Resource Services, LLC.
Environmental Studies Group
Rocky Flats Environmental Technology Site
MAP ID: 98-0165WAP

Figure 4-2

**Selected Dissolved Metals (ug/L)
at the Present Sanitary Landfill
1997**

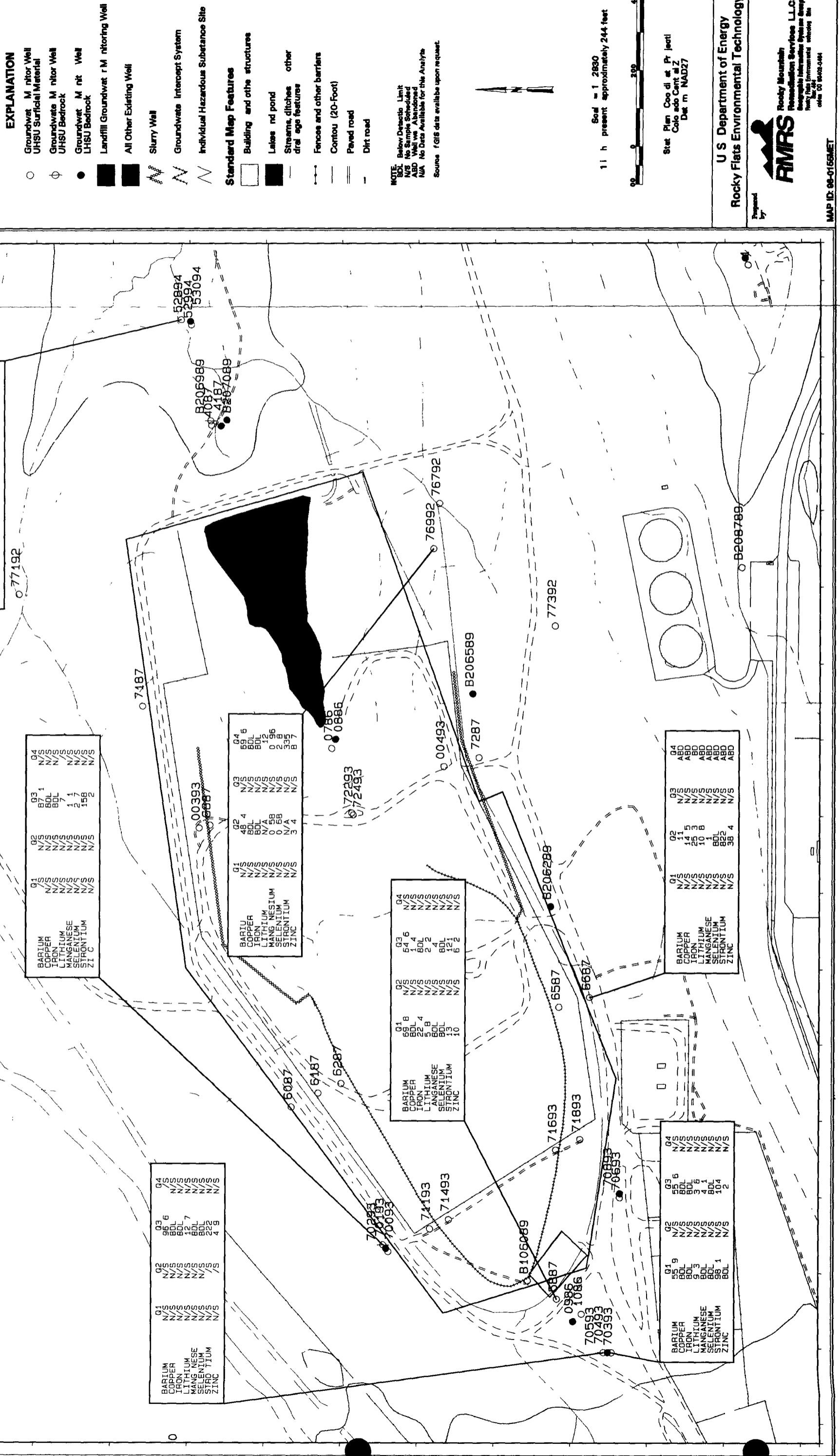


Figure 4-3
Tritium & Dissolved Uranium (pCi/L)
at the Present Sanitary Landfill
1997

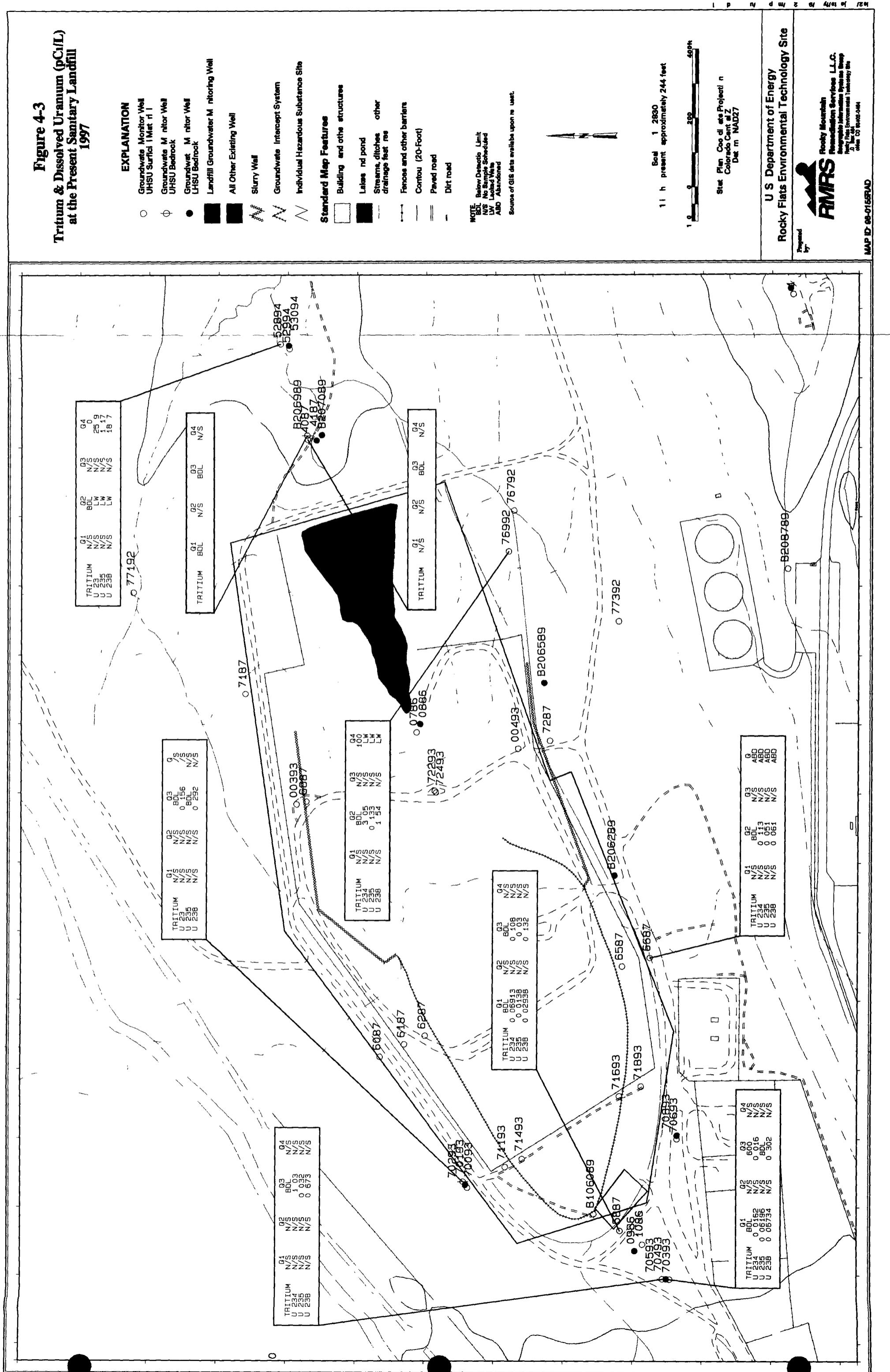


Figure 4-4
Detected Volatile Organic
Compounds (ug/L) at the Present
Sanitary Landfill
1997

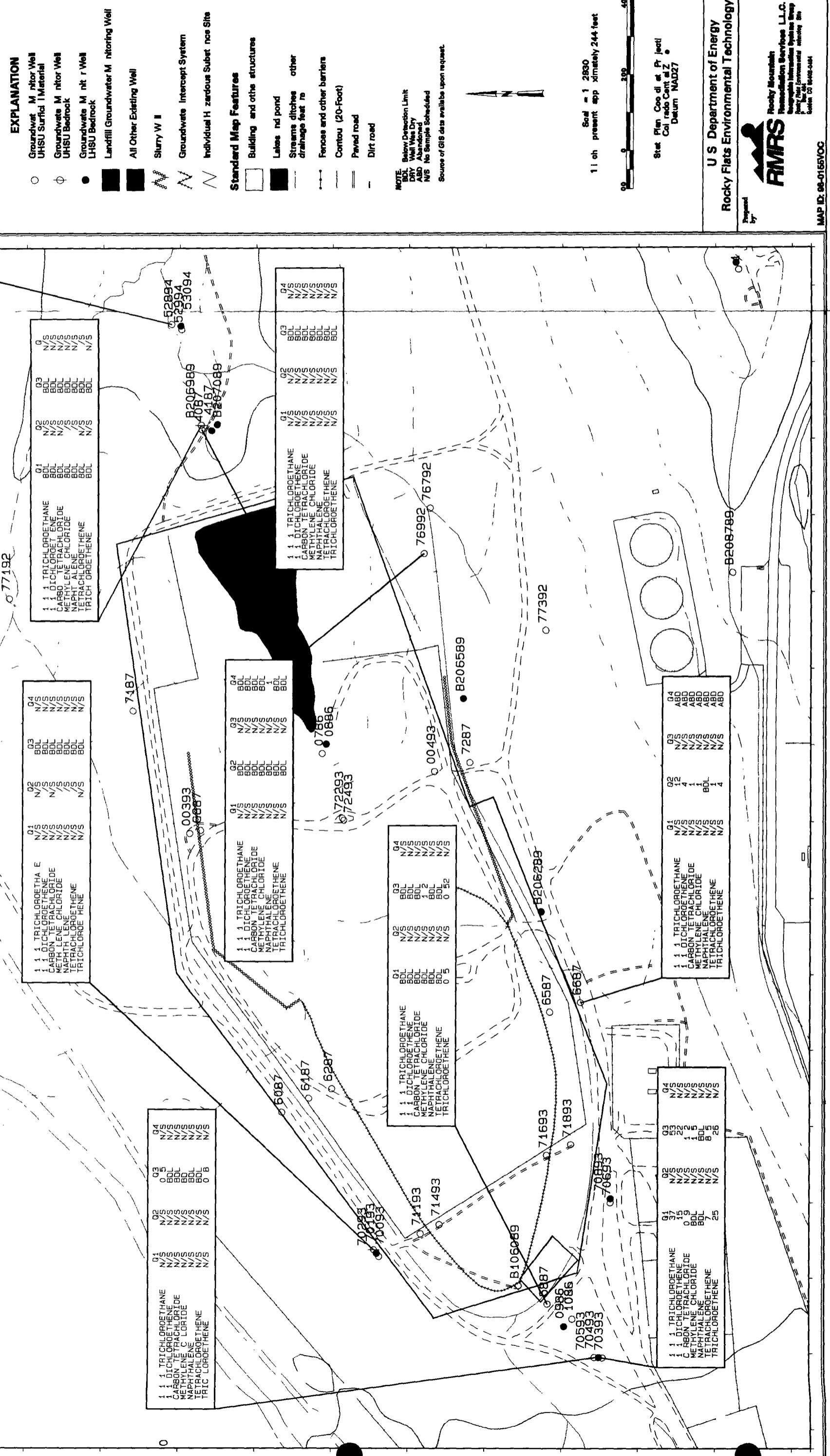


Figure 7-1
PUD Yard Monitoring Well Locations and IHSS Boundaries
1997

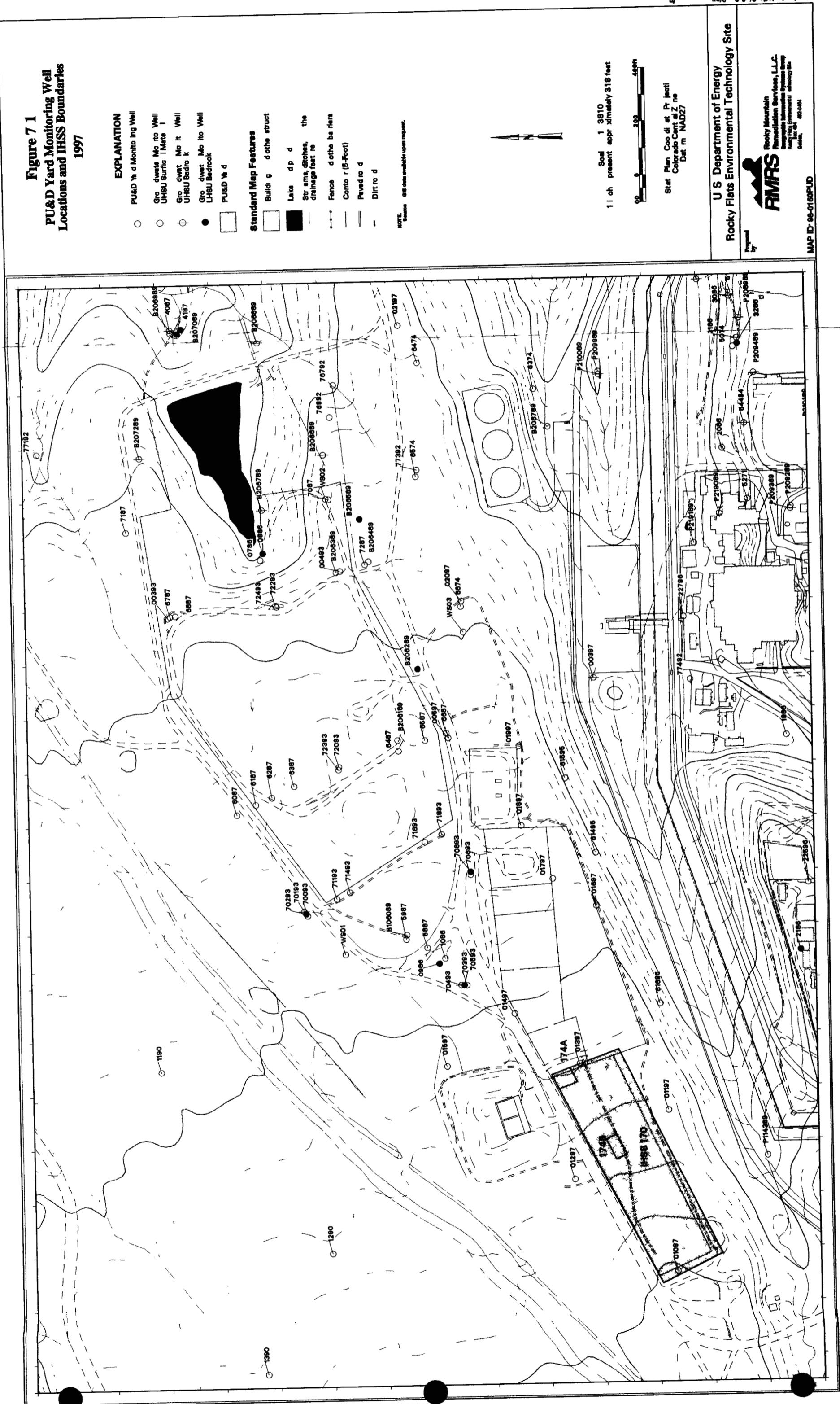


Figure 7.2
PU&D Yard
Groundwater VOC Plume
1997

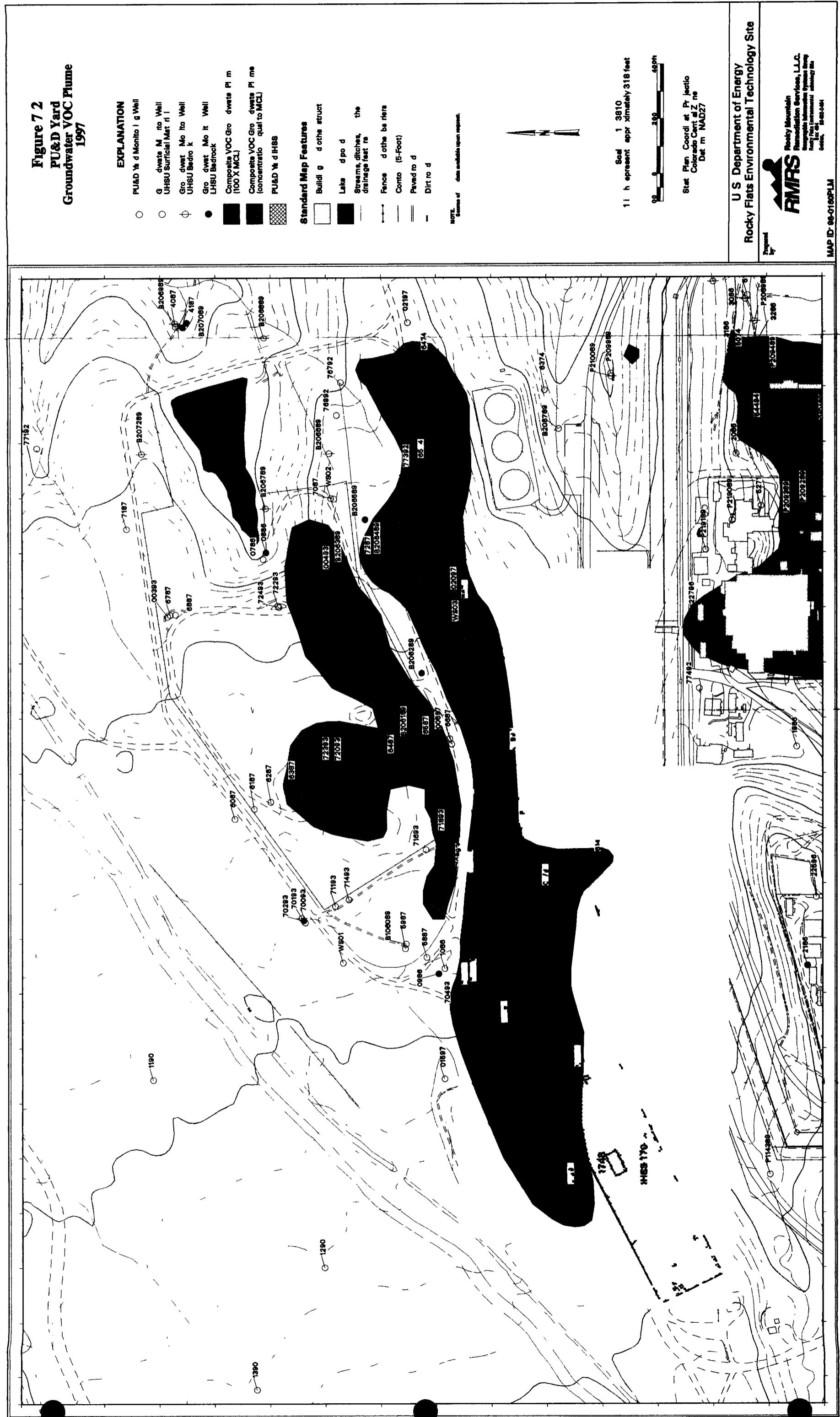


Figure 8-1
Present Landfill
Well Abandonments
1997

EXPLANATION

- Groundwater Wells**
 - Abandoned Well
 - Slurry Well
- Groundwater Intercept System
- Individual Hazardous Substances Site

Standard Map Features

- | | | | |
|---|---|---|------------------------------------|
| <input type="checkbox"/> Buildings and other structures | <input checked="" type="checkbox"/> Lakes and ponds | <input type="checkbox"/> Stream, ditches, other drainage features | <input type="checkbox"/> Other |
| <input type="checkbox"/> Fences and other barriers | <input type="checkbox"/> Contour (5-Foot) | <input type="checkbox"/> Paved road | <input type="checkbox"/> Dirt road |

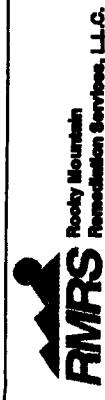
NOTE:
Source of GDS data available upon request.

Scale 1:2830
1 inch present approximately 244 feet



State Plan Code at Pt. 101
Colo. add Cont. Z
Datum NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site



Map ID: 98-0160ADN
Prepared

